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ORIGINAL ARTICLES.

ACUTE INTESTINAL OBSTRUCTION AND THE USE OF SALINE CATHARTICS FOR DIAGNOSTIC PURPOSES.

Read by Title in the Section of Surgery and Anatomy, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, June, 1892.

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The diagnosis of a chronic intestinal obstruction can usually be determined by its clinical history and its symptoms with sufficient clearness, and in time for definite action. Acute intestinal obstruction is often sudden in its onset and obscure in its symptoms. Destructive local changes occur in a few hours, and grave constitutional complications develop with surprising rapidity.

A severe colic or an acute peritonitis may produce symptoms which strongly suggest intestinal obstruction. The three cardinal symptoms of obstruction of the bowels, nausea, pain and constipation, are present in each one of these three distinct diseases. The three conditions require widely different treatment. The pain and collapse of a severe colic, an obstruction, or of peritonitis, demands immediate relief, and we promptly and unhesitatingly resort to opium for its control. Opium arrests pain, allays vomiting and delays impending collapse. It so mitigates every symptom of colic, peritonitis or obstruction, that the differential diagnosis becomes obscured, and a doubt which paralyzes action is engendered in the mind of the physician.

Every practitioner has witnessed the disastrous effect of the delay that is imposed by this uncertainty. Many of the cases of obstruction, with stomach emptied of its contents, and relieved of pain by the prompt administration of opium, remain quiescent for many hours. The flaccid abdomen, the soft regular pulse, the normal temperature and the absence of tenderness and pain, allay anxiety. The anorexia and indisposition to move about the bed do not determine the condition. Meteorism may be present, but neither its presence nor its absence determine the solution of the problem.

This condition of doubt may exist until very serious local changes have occurred in the strangulated loop, and with but little evidence of change in the general condition, until the final collapse develops suddenly on the fifth or sixth day of the sickness.

It is a clinical fact, too often overlooked, that a very tight constriction of the bowel, one that promptly causes gangrene of the strangulated loop. gives but very little local evidence of its presence. It does not so quickly cause a local peritonitis as does that strangulation which, while preventing fecal movement, only impairs the free circulation of blood, thus promoting engorgement and inflammation, with its attendant pain and tenderness.

The text-books have taught, and the profession has insisted, that a purgative in intestinal obstruction was an unmitigated evil. Indeed, so strong is this feeling that it is almost regarded as criminal to use it where obstruction is suspected. Yet the use of enemas in supposed intestinal obstruction is a very common practice. Enemata are above everything the remedy for the obstruction of a fecal accumulation, but this condition is not usually difficult of diagnosis and is not now under consideration. What do the large fluid injections accomplish in a case of obstruction from other causes? The enema may bring away more or less of the contents of the lower bowel. It arouses a peristalsis unpleasant to the patient and inefficient in its purpose. The enemas hasten the destructive changes at the point of strangulation, and they do not make clear the diagnosis. Its repeated use hastens the final collapse even as a purgative does. Yet the patient submits to and the physician persists in its repeated and continuous use. It is not efficient above the colon except by peristalsis. The danger of a purgative lies in the peristaltic action which it excites. Without it, the patient will frequently, under opium, remain several days with but little peristalsis, though the destructive changes are silently advancing at the point of obstruction. The decomposition going on in the contents of the intestinal canal is rendering the fluid offensive; the sensitiveness of the intestine above the obstruction is increasing, and grave vaso-motor changes are undermining the resisting powers of the individual. When peristalsis is finally aroused by nature's forces in spite of opium, and just as the diagnosis becomes clear, the patient succumbs, and dies in spite of operative interference, which is then urgently demanded by the patient and the attending physician.

How can we solve the doubt and make a positive diagnosis in time to act efficiently and save the patient? This is the problem. I believe the much abused purgative will help us in the early diagnosis, if used properly and at the right time. I think we may assume that:

First: There is legitimate reason for the most skilled diagnostician to be in doubt in some cases of intestinal obstruction.

Second: The differential diagnosis rests ordinarily between colic, peritonitis and obstruction.

Third: Laparotomy is accepted as the most reliable therapeutic measure for the relief of intestinal obstruction.

Fourth: Laparotomy, to be a good therapeutic agent, must be performed early in the existence of the obstruction.

Pain, vomiting and constipation are the three cardinal symptoms of obstruction; yet these conditions are present in constipation, in intestinal colic, and in many diverse conditions.

What are the effects of a saline cathartic on the three conditions above mentioned, viz.: colic, peritonitis and intestinal obstruction?

Colic: It will purge a case of colic, and a sedative then cures it.

Peritonitis: It may arrest a peritonitis.

Obstruction: It will develop and make plain the more serious condition of a mechanical obstruction. If given early in the case, the distress and aggravation of the symptoms which it arouses will subside under the use of morphine, and the general condition will then permit operative relief.

It is only where the doubt is sufficiently strong to control action that the saline purgative is used. It should be promptly given. The time for its efficient administration is in the lull or quiet induced by the first dose of morphine. It may again arouse ineffective and painful peristalsis, but it will in many cases resolve doubt and determine surgical interference when it is still possible to save the patient.

If the diagnosis of obstruction is clear, there is no excuse for a purgative. No one would attempt to relieve an intussusception, a hernia, a volvulus or a stricture by a purgative. They aggravate and make more urgent every symptom which attends the condition. Yet this is a good reason to administer a saline cathartic in the beginning of many doubtful cases as a diagnostic measure.

A purgative in intestinal obstruction is an unmitigated evil in its effects upon the strangulated loop and the patient. It should not be given unless it is for the benefit of the surgeon and to purge our minds of doubt. But it seems to me that the great uniformity with which cases recover from the primary depression and collapse which so frequently announces the onset of intestinal obstruction, indicates to us the possibility of using a purgative as a diagnostic agent rather than an exploratory laparotomy in the earlier hours of the disease. If the peristalsis which inevitably sooner or later declares itself, and convinces the most skeptical patient and the most obtuse physician that the obstruction is pronounced and absolute, is promptly aroused by a saline cathartic given before the destructive changes have occurred, and before the vitality of the patient has been exhausted, the action thus aroused will again subside under the use of opium (morphine), and the depression which is occasioned by its use will disappear, leaving an open field for the surgeon.

Laparotomy has rapidly grown in favor as the most reliable therapeutic measure for the relief of intestinal obstruction, if resorted to early in its existence. Surgeons sometimes conceal their ignorance by "explorative laparotomy." Exploratory laparotomy, where symptoms of intestinal obstruction are present, may lead to the prompt recognition of the condition and its cure; but it is a dangerous proceeding where meteorism is present, circulation feeble and inflammation already existent. These conditions may exist without mechanical obstruction and without the existence of a condition amenable to operative measures. I believe we can avoid some of these useless operations, and save many patients, by promptly resorting to the less dangerous saline cathartic. It will be admitted when laparotomy would not be considered. It will eliminate doubt, and enable the physician and surgeon to intelligently urge a prompt resort to the efficient treatment necessary to relieve an obstruction, viz.: laparotomy.

If it has been determined to perform laparotomy, the cathartic is of course not to be considered. If, however, there is a case anxiously and carefully considered for twenty-four hours (an arbitrary but not a standard time), and grave doubt is still present concerning the condition, an efficient saline cathartic (Epsom salts), followed by an enema, may solve the doubt. It should be remembered that the saline cathartics are dependent upon a fair amount of fluids in the body for their efficient action, and if they are given after a patient has been for a number of days without imbibing fluids, they will not act. The paralysis which attends intestinal inflammation will also interfere with their action.

Will you, in a doubtful case, if presented within forty-eight hours of the onset of the trouble, wait and let time resolve the doubt and destroy your patient, or make an exploratory laparotomy on a patient who does not need it? It appears to me that a purgative is the third and safest method of solving the doubt.

The free, spontaneous action which follows relief from an obstruction, whether by nature's unaided effort or by surgical interference, not infrequently produces such a co'lapse that death follows. Death may be precipitated by cathartics if used when obstruction has existed for any length of time, but it cannot be said that they cause it, for the obstruction surely determines conditions which finally excite the peristalsis, collapse and death, and the longer the peristaltic action is delayed the more dangerous it is.

Intestinal obstruction may exist for days without developing any more positive signs of its presence than we frequently see in obstinate constipation with its attendant pain, sick stomach, meteorism and prostration. It is for these doubtful cases that I urge as a conservative measure the administration of a saline cathartic. I am sure the modern physician will admit that there is legitimate reason for doubt in the diagnosis of at least a small percentage of cases of intestinal obstruction in the early stages of their development.

ON THE TREATMENT OF INJURIES OF THE ABDOMEN NOT REQUIRING SURGICAL OPERATIONS.

Read in the Section of Surgery and Anatomy, at the Forty-third annual meeting of the American Medical Association, held in Detroit, Mich., June, 1892.

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In practice the stubborn facts are daily demonstrated that the prognosis of wounds of the abdomen is very unfavorable, the diagnosis frequently obscure or recondite, and the results of treatment often unsatisfactory; especially so in the hands of the general practitioner. Hence, any account which gives the results of experience must be of interest to the profession, even if not of much value in itself. It is easy enough to theoretically draw the line between operable and non-operable cases in abdominal injuries, but in practice it is often the most difficult question to decide in the whole domain of surgery; especially where there are no external wounds or bruises to serve as guides.

The well established fact, accepted by surgical authorities of all ages, that the peritoneum is especially prone to become inflamed when it is lacerated,

bruised or disturbed, or the ease with which an inflammation extends to it from neighboring organs, should never be lost sight of. If there is laceration or displacement of any of the important organs, it may be necessary, or the positive duty, to perform laparotomy and adjust the rent or displacement at once.

For purposes of study, injuries of the abdomen may be divided into four classes:

1. Injuries involving the parietes only, in which the integument remains unbroken.
2. Injuries in which the integument is unbroken, but some of the internal viscera are involved in the injury.
3. Injuries in which there is a solution of continuity involving the parietes only.
4. Injuries in which there is an open wound in the parietes and the internal viscera are also involved.

The last two of these classes may be dismissed at once from consideration in this paper, as their treatment is by operative means from the beginning.

In injuries involving the parietes only, there may be extensive infiltration of the cellular tissues; the principal symptoms in such cases are pain, soreness, swelling and ecchymosis, and a doughy, crackling sensation on palpation. In other cases there is an accumulation of blood between the muscular layers; in these cases there will be more or less pain, soreness, and a swelling which will impart a spongy sensation to the examining finger. In another class of cases there is rupture of some of the muscular fibres, when there will be severe pain and soreness to the touch, which is greatly aggravated by motion, and, if the tear is extensive, an inability to stand erect, without support. The examining finger will detect a more or less abrupt indentation; or only a soft, non-resisting condition over the site of the injury.

Although these cases may appear simple, the prognosis should be guarded; the most serious consequences may follow an apparently slight injury. The treatment should be thorough and careful. Inflammation may extend to the peritoneum, this must be looked for and guarded against. Suppuration may follow with extensive burrowing of pus, when it will be necessary to make a free incision and wash out the pus cavity.

In extensive rupture of the muscular tissues recovery will be slow and may be followed by more or less permanent pain and weakness of the muscles, and finally a hernia. These ruptures are usually produced by sudden violent efforts, as in falls, lifting or gymnastic exercises, etc. The treatment of these cases is the same as that for the second class, which will be given further on.

We now come to the second class, or injuries in which the integument is unbroken, but some of the abdominal viscera are involved. Here the practitioner of surgery finds himself confronted by one of the most trying circumstances in the whole range of practice.

The abdominal cavity contains more viscera with dissimilar functions than any other cavity in the human body; hence, an injury to this part of the body will produce a great variety of symptoms. Before an intelligent line of treatment can be instituted it is necessary to decide, if possible, the exact nature and extent of the injury.

Probably one of the most common sources of danger in injuries of the abdomen is shock produced by bruising or otherwise injuring the abdominal nerve centers. The epigastric or solar plexus supplies all the viscera in the abdominal cavity. It receives all the fibres of the great splanchnic nerve, part of those of the lesser splanchnic nerves; also the terminal branches of the right pneumogastric nerve. The semi-lunar ganglia are part of the solar plexus; they receive the great splanchnic nerve, the origin of which is from the lower thoracic ganglia. Each of the thoracic ganglia is connected to the nearest anterior root of the spinal nerve; and the skin of the epigastrium is supplied by these very same spinal nerves, viz., from the fourth to the seventh intercostal nerves. There is therefore a complete nervous circuit from the mucous membrane of the stomach and intestines to the skin of the epigastrium.

Having thus in mind the innervation of the abdomen, we can more rationally explain the cause of the serious symptoms which follow an apparently trivial injury of this part of the body.

When called to treat a patient who has received an injury of the abdomen, it is necessary to discover if possible, the nature and extent of the damage done. Is there only contusion of the parietes and viscera or are some of the internal organs ruptured or dislocated, and if there is an organic lesion, is it of such a nature as to require an operation? There may be rupture of the diaphragm, stomach, intestines, liver, bile duct, spleen, pancreas, supra-renal capsule, kidneys, ureter or the bladder. Or these several organs may be more or less bruised or displaced. While there are few, if any, pathognomonic signs for any of these lesions, yet the most of them may be detected or very strongly suspected if all the symptoms in any given case are carefully investigated.

There may be serious nerve disturbance from simple contusions of the abdominal parietes, but usually when there is profound shock following an injury in this region, it is tolerably safe to conclude that there is more or less damage done to the viscera, not necessarily of the nature of an organic lesion, however. When there is excessive pain, rapid weak pulse, great restlessness and anxiety, persistent vomiting, catchy, spasmodic respiration, with a feeling on the part of the patient that he is dying, or if there is delirium, or unconsciousness, one may safely suspect that some of the internal viscera are seriously damaged. While collapse is a common occurrence after abdominal injuries, yet cases in which there was so serious an injury as rupture of the liver or intestines have been known to happen without being immediately followed by this symptom. When shock is of short duration there is a reasonable probability that there is no serious internal injury. In collapse from nervous shock following an injury of the abdomen, in which there is little hæmorrhage, the skin is usually cyanosed, cold and clammy; while in serious internal hæmorrhage the skin is pale, cold and with less moisture.

Persistent vomiting is an indication of severe shock or serious disturbance of some of the internal organs; when blood is vomited the injury is probably of the stomach. Pain is often an uncertain diagnostic guide, while localized tenderness is usually of great value. Experience shows that injuries received above the umbilicus are more frequently serious or fatal than in those where the injury is below that point. This is due to the fact that more of the important organs are located above that point than be-

low it. In the act of respiration there is also more disturbance of the parts in the upper portion of the abdomen. Valuable information may often be obtained by a close inquiry as to how and by what the injury was done; and the position and condition of the patient; if a heavy wheel or roller has passed over the body, or if the body has been caught between two heavy moving bodies, there is a greater probability of rupture of some of the internal organs or blood vessels than if he was struck while standing free; or had fallen against an object.

The shape of the impinging body will often serve as a help in deciding the amount and kind of injury done. The thickness of the abdominal walls should also be taken into the account; if they are thick and fleshy they will offer a considerable protection to the internal viscera. Shortly after a meal when the stomach is full it is more readily ruptured than when empty. So with the bladder, it is more readily ruptured when it is full; in this condition it also rises higher in the pelvis and is thus more exposed. The following are the principal symptoms usually found when the several organs are severely injured. In rupture of the diaphragm the most prominent symptom is an unsatiable thirst. In the case of a large man who fell from a train while it was passing over a high trestle there was constant craving for water, quick superficial respiration. He died on the third day; there was a rent 2½ inches long in the diaphragm on the left side, the peritoneum congested and the right thigh was fractured. I have been unable to find reports of instances in which the diaphragm was sewed up after such injury. Spontaneous unions are not rare but are usually followed by phrenic herniæ. In rupture of the stomach there is usually profound shock, vomiting of blood and a constant, severe, radiating pain from the seat of injury; recovery has taken place, without an operation when the rent was small. In laceration of the intestines there is meteorism, pain of abdomen and great tenderness; the muscles are rigid and unyielding to the touch; breathing is short and thoracic; countenance expressive of distress and anxiety; vomiting early and severe; thirst and profound shock; unless the rent is small death will follow, laparotomy is usually the only hope.

Rupture of the liver is usually followed by jaundice and itching of the skin; white stools and saccharine diabetes; pain and tenderness over the region of the liver. Patients have recovered from extensive injuries of this organ without operative treatment. When the bile-duct is ruptured there is usually severe pain in the hypo-gastric region, great anxiety and restlessness followed by collapse; this usually terminates fatally. The principal symptom in rupture of the spleen is rapid and profound collapse, produced by the violent hæmorrhage which usually accompanies this injury; the pain is located in the left hypochondriac region. Recoveries have taken place, after rupture of this organ, without surgical aid.

There are no symptoms recorded in injuries of the pancreas which would be of any diagnostic value. There is not much hæmorrhage, and severe injuries are not necessarily fatal. The peritoneum is thin and readily ruptured when put on the stretch; in such cases there is great tenderness over the whole abdomen, pulse very rapid and small, excessive tympanitis; the lower limbs are drawn up, and the upper portion of the body bent forward.

In rupture of a kidney there is vomiting, some collapse, pain along the course of the ureter and in the lumbar region; retracted testicle and pain along the spermatic cord; a constant desire to urinate, but often an inability to do so; the urine is usually bloody and scanty. In a railroad injury in which the right kidney was ruptured and the right foot mangled, there was, throughout the four days the patient lived, numbness of both thighs. Rupture of the kidneys is not necessarily fatal, especially if the injury is on its posterior surface. Opium should be given cautiously in injuries of these organs.

When a ureter is torn there is not usually any very serious symptoms immediately following; but in the course of a few weeks a large tumor will develop on the affected side; this when tapped will prove to be caused by an accumulation of urine, blood and probably pus.

When the bladder has been ruptured there will be a constant desire to urinate; the urine is usually scanty and bloody; pain about the pelvis excessive; patient is unable to stand or walk.

Out of 200 cases tabulated by Rivington but 8 recovered. Operative measures appear to offer the best hope of success.

In rupture of a large blood vessel collapse does not usually follow immediately on receipt of the injury; the patient often being able to walk some distance before exhaustion is produced from the excessive hæmorrhage. In internal hæmorrhage collapse is often a means of temporarily checking the hæmorrhage.

The surgeon usually finds the patient in a state of cardiac depression and shock with nausea, vomiting, pain, restlessness, cold extremities, shrunken condition of the skin and clammy perspiration. The abdominal muscles are in a state of tonic contraction. It is important to note that this inhibiting condition extends frequently to the muscular coats of the intestines and sometimes to the urethra and ureters; for in many cases there is suppression of urine and obstinate constipation of the bowels. This condition may continue from a few hours to several days. If the patient survives this condition or is relieved by artificial means then there follows a stage of reaction and probably inflammation. If the inhibited condition is not relieved the patient usually dies in this stage of shock. So that the first important object to be accomplished is to restore the innervation to its normal condition. This is best accomplished by external and internal warmth. Stimulants by the stomach frequently are of no avail, from the fact that they are not assimilated; in such instances they are best given hypodermatically. Brandy, nux vomica and digitalis are usually the most available and may be administered either way. Draughts of hot water are also of much value, even if vomited. Hot applications, to the extremities, of mustard draughts or flannel cloths wrung out of a strong solution of capsicum are valuable restoratives. As stated in the foregoing pages, in many of these cases there is a firmly contracted condition of the muscular coats of the bowels causing obstinate obstruction. It is surprising in how short a time the contents of the intestines will become hard and dry after an injury to this region. In many cases the state of collapse will not yield until, this source of irritation is relieved. I hope to illustrate by the following cases how rapidly such cases will recover from shock after the bowels

have been cleared of their hardened contents by hot water injections. The hot water serves a two fold purpose; it clears away the hardened and dried feces and thus removes a future source of irritation and infection; the hot water also is a direct stimulant to the nerve endings in the intestines. The injection should be used as soon as possible after the receipt of the injury. The rationale of this treatment will be readily understood if we call to mind the position of the solar plexus with its numerous satellite plexuses. To illustrate the results of this method of treatment I will report briefly three cases; selected so as to show the different methods of injury by which such cases occur.

In August, 1883, I was called to see R. W., a farmer, who had been struck by one limb of an A-shaped harrow, which he was trying to lift over a stump while the horses were dragging it over the ground; the principal injury being received between the crest of the ilium and the lower ribs, on the left side, and extending across the abdomen. I saw him twenty hours after the injury had been received. His face was pale and the features pinched; the whole surface and extremities cold and clammy; pulse barely perceptible at the wrist; abdominal walls were hard and contracted, but slightly distended. He was very restless, writhing and twisting over the bed, and complaining of severe pain in the abdomen. He had not had a discharge from his bowels or bladder since he had received the injury. After administering some palliative remedies, I introduced a catheter and drew off several pints of bloody urine. The pain and restlessness still continued. He was then given a large injection of hot water, which brought away a large quantity of dry, hard nodules of feces. This was repeated several times with like effects. He gradually rallied from the collapsed condition and made a good recovery. Within a year chronic Bright's disease developed, from which he finally died.

In September, 1884, I saw in consultation M. W., a carpenter. Thirty hours before, he had received an injury of the abdomen by making a misstep while walking on an uncovered joist in the second floor of a building; the principal force of the blow taking effect over the region of the umbilicus. I found him in an advanced stage of collapse, in spite of stimulants and external warmth, which had been freely employed. The abdominal walls were very hard and retracted. He had not had an evacuation of the bowels since the injury had been received; the kidneys had acted freely. I advised enemas of hot water, which resulted finally in free evacuations of dry, hard stools. He shortly afterwards rallied, and finally recovered.

In November, 1883, I was called to see F. F., a brakeman, who twelve hours before had been caught between the tender of an engine and a freight car He had sustained a severe squeeze; the principal force being exerted over the abdominal region below the umbilicus. When I first saw him he was not suffering from localized pain, but was very restless; temperature normal; abdomen not swollen, but the walls were hard and rigid. He had not urinated nor had an evacuation of the bowels since the injury. Pulse was not seriously depressed. I drew off the urine with a catheter and administered a saline cathartic, and gave him anodyne remedies. But the restlessness continued and finally developed into unconscious delirium, so severe that it required two men to hold him on the bed. Several doses of the cathartic remedy failed to produce the desired effect, so an enema was ordered. Diligent efforts by this method brought away several large evacuations of hard, lumpy stools, after which consciousness was restored, the restlessness subsided and the rigid condition of the abdomen gave way. For nearly one week the urine had to be drawn off with the catheter. The abdomen became tender and tympanitic from localized inflammation of some of the abdominal organs. At the end of ten days the symptoms subsided, and the patient finally made a good recovery.

The patient having been restored from the shock and collapse, our next duty is to combat inflammation and support the system. Rest is of first importance, and should be continued until all traces of inflammation have been subdued. Many patients have been lost by a neglect of this simple precaution. The following case will serve as a striking illustration of this point:

In September, 1887, I was called in consultation to see R. W., a carpenter, who had fallen on to the flange of a car wheel, while he was carrying a heavy load, striking himself on the right lower quarter of the abdomen with considerable force. He continued to work that day and the next, but felt considerable soreness and pain over the seat of injury. The second and third days he suffered still more severely, so that he did not attempt to work, but was up and about most of the time. On the fourth day the pain was so severe that he was confined to bed; on the fifth day, being still worse, he called in a physician, who found him with a slight fever, abdomen distended and very tender, pulse quick and thready. In spite of careful treatment these symptoms grew more severe until the eleventh day, when I first saw him. He was then in a state of collapse, and died several hours later. A post-mortem examination was made the next day. The major portion of the peritoneum and intestines showed evidences of inflammation, and in the lower and right portion of the abdomen they were extensively gangrenous.

I regard this as a very instructive case. There is good reason for believing that had this man taken rest, and some proper treatment, during the first days after the injury, he would not have developed any serious symptoms. This case also illustrates another important fact: that a severe localized inflammation may run to a fatal termination without the fever ever reaching a high point. The fever in this case never reached above 102°. Is it not probable that the injury to the nerve ganglia, in these cases, is so great that the system virtually never recovers its natural tonicity?

In combating inflammation, it is important to keep the patient cool and quiet; the dorsal position is the best, with the head and shoulders elevated and the lower limbs flexed, so as to relax the abdominal muscles. Next in importance, and to aid in keeping the patient quiet, is opium; it should be pushed until pain is relieved and quiet restored. With the opium give $\frac{1}{10}$ gr. doses of calomel from the beginning; it will keep the portal circulation, which collects the venous blood from the viscera of digestion, active, and thus relieve congestion of the stomach and intestinal canal, and its accompanying glands. Instead of calomel, small doses of sulphate of magnesia may be given, but not to catharsis. When the fever is very high with a full, sustained pulse, aconite in small and frequently repeated doses should be given during the first few days. Locally, leeches may be applied over the point of greatest tenderness and extravasation. Fomentations of flannel sacks filled with hops, steamed until they are hot and damp, then applied constantly over the whole abdominal surface, will relieve pain and soreness, and serve as a restorative. If the warm applications are ungrateful to the patient, poultices made of ice and linseed meal may be used; but usually the former is the best.

The diet should be spare, liquid, easily digested and given cool. Milk is usually the best; blanc mange, custard, lemon sherbet, ice-cream and gelatine are all good. It is important to keep the bladder well emptied, and if necessary use the catheter every four to six hours. In nearly all cases of injury of the abdomen the urine will contain pus in the course of a few days; this should be detected by microscopic examinations of the urine, and when present, I know of no remedy so beneficial as salicylic acid, given about every four hours in 5 gr. doses. Throughout the treatment the surgeon should be very guarded in his prognosis, and exceedingly careful and thorough in his treatment. Every injury should be treated as if it were serious from the beginning to the end.

Dr. Mordecai-Price, of Philadelphia, being absent, his paper on "Emergency Work in Abdominal Surgery" was read by title, and Dr. John L. Link, of Terre Haute, Ind., occupied the time allotted to the paper in a discussion on emergency work. He said a wound should be probed as far as the probe will go, and the knife should follow as far as the probe went. Physicians should be held strictly responsible for not operating in cases of injury to the abdomen. Even if he takes an ordinary needle and thread and sews up the wound, it is better than to leave it alone. He reported a case of operation on a dog in which he put in stitches of ordinary cotton, and the dog recovered. The coarse thread sets up an inflammation which causes the neighboring parts to adhere and close the wound.

Dr. Halley, of Missouri, wanted to know if he did nothing to render the thread antiseptic, and received a reply in the negative.

Dr. Quimby, of New Jersey, thought that by following the wound made by a sharp, narrow instrument, with the knife, the operation would be worse than the original wound.

Dr. Senn, of Chicago, was of the opinion that operations should be thoroughly done or not at all. To illustrate his point he reported a case in which a young man was shot through the abdomen. Two very respectable physicians were called, and they, having heard of the new treatment in cases of this kind, viz.: to follow the track of the bullet, opened the abdomen, inspected the intestinal coils and adjacent viscera, and finding no injury to them, closed the wound. The patient, who never rallied from the operation, died in twenty-four hours, and the autopsy revealed more than one perforation. He believed this kind of teaching to be exceedingly injurious to our profession, and only when we can satisfy ourselves that the injury will necessarily prove fatal, should we add the additional risk of operation.

Dr. Halley, of Missouri, said that every one who operates to-day must do so with careful aseptic and antiseptic precautions, therefore every surgeon who does an operation without these safeguards is little better than a murderer. Many a perforation of the intestinal canal will recover if left alone.

Dr. Link said he believed in all the preparation spoken of, but also believed that more cases would recover with operation than without.

The paper on "The Present State of the Surgery of the Vermiform Appendix," by Dr. J. A. Wyeth, of New York, was read by title. Dr. Milligan, of New York, occupied the time in reporting a case of undescended testes associated with hernia operated on by Baccini's method. His remarks were illustrated by diagrams.

HERNIÆ, OPERATIVE AND NON-OPERATIVE.

Read in the Section of Surgery and Anatomy, at the Forty third Annual Meeting of the American Medical Association, held in Detroit, Mich., June, 1892.

BY THOMAS H. MANLEY, A.M., M.D.,
OF NEW YORK.

As hernial protrusions through the lower abdomen are a very common infirmity in the civilized human being; and as they are always a source of inconvenience and discomfort, besides being an occasional danger to life, surgeons have, since the earliest times, actively occupied themselves, with a most commendable zeal, in divers expedients to effect a radical cure of them, or to place them in such a position as will conduce to the greatest comfort. Every sort of mechanical expedient has been resorted to for their cure, by traveling charlatans and eminent operators; at one time resorting to castration, at another to vitriol and caustics, the potential and others, the steel clamp, suture of gold, invagination, etc.

Paul Légond,[1] in his valuable treatise on hernia, informs us that for several past centuries, from time to time, operations for the radical cure of hernia have attained considerable popularity; but they have fallen into ill-repute and been condemned, to be again revived. From the graphic description which Ségond gives us, we can see that the methods and technique of operation in bygone times were manifold and varied, and that so thoroughly and completely have the ancients gone over the field, that but little remained for the moderns to improve on. Hence we see that the vast majority of certain modern hernial operations, bearing the names of various surgeons, are not new at all, but have each and all, with few exceptions, been performed many centuries since. The cardinal object in view, in all cases and at all times, has been the same. The characteristic of the attitude of surgeons towards hernial operations, has been towards extremes.

As recently as twenty years ago, but few, if any, operations for hernia were countenanced or permitted, except in cases of strangulation. Now, the opposite practice prevails. Not here in America alone, but in all the principal countries of Europe, every sort of visceral protrusion through the crural or inguinal rings is, by many, regarded as appropriate for active, surgical intervention.

But no operation yet devised will always prove permanently curative, in any class of cases. Surgical methods, however, will nevertheless, in a certain proportion, cure the hernia. In some it may effect no improvement, and in certain varieties, the mortality following operations on them is very great, regardless of what skill may be employed.

With a view of reaching the middle ground and defining those cases in which surgical operation may seem permissible, and describing those cases in which we should decline the application of sanguineous measures, these notes are submitted to the consideration of my professional brethren.

A Few General Considerations on Operative Herniæ.—There are certain conditions which should not be lost sight of, in all hernial operations, regardless of whether they are hospital or private cases.

To commence, we should have a thorough familiarity with what might be designated the *natural history* of hernia; its complications and almost infinite varieties; what we may look for by Nature's unaided powers, and what may be accomplished by a tentative therapy, in effecting a cure or placing the hernia in a comfortable position. Before a thought of cutting should enter our minds, in hernial cases, we should weigh well the consequences; not the immediate only, but the remote as well. Without question, in a considerable number of cases in which relapse occurs after operation, the hernia may become more painful and unmanageable than it was before anything was attempted, in the way of a radical cure.

Hence, we should, before resorting to radical methods, consider carefully the possibility of relapse, and likewise warn our patients of its possibility. Much will depend on the class of patients which we will have to deal with, for the permanency of cure, will in a large measure depend on the intelligence and disposition of the patient.

But, as has been stated, many herniæ will relapse in a considerable proportion, regardless of what operation may have been employed. Indeed, Dr. W. T. Bull, of New York, at a recent meeting of the American Surgical Society, showed by an elaborate array of figures, that the recurrence of the protrusion is so general, after surgical interference, that the employment of the term *operation for "radical cure"* should be abandoned altogether. And the distinguished French surgeon, M. Paul Légond, in his work printed ten years ago, put great stress on the fact

[1] Cure Radicale des Hernies, Traité.

that any of the operations might kill—*peut tuer*—and that none, of any description whatever, is ever a justifiable procedure in herniæ, "except those in which the dangers from delay are in direct proportion to those entailed by surgical intervention, and then only when all other expedients have failed."

Félizét,[2] on the other hand, is an ardent advocate of operation in hernia; yet he does not hesitate to openly avow it, that the surgeon should never permit himself to be swayed, in these cases, except through humane impulses. "While," he says, "anæsthetics have rendered the most tedious and formidable operations painless, and rigorous antisepsis has rendered septic infection impossible, yet neither has changed the morale of our art, and hence the scalpel should not be taken up, except in those, on whom palliative measures have proven useless and the hernia becomes progressively worse with the advance of age."

As all herniæ operated on, in which the patient survives, are invariably radically cured, and quite a number remain so during life, to the great comfort of the formerly afflicted, it seems absurd to ask us to disregard the evidence of our own senses.

No sort of operation known in surgery can, or has, ever perfectly reconstructed anything. We *cure* a man of a dislocation, a fracture, a fistula or a stricture. But have we removed the causes which led to those mechanical and pathological conditions, or have we been able to restore anything like perfection?

Any one who has ever carefully dissected the inguinal or crural structures in a hernia, of any age, will always, on a critical examination, discover a defective development, a want of symmetry and uniformity, in those anatomical structures which support the abdominal contents. Hence, he who pretends that any sort of operative measure, no matter how skilfully performed, will ever accomplish more than improve the herniated condition by confining the viscera above, or so placing them that they will occasion but a minimum of future trouble, trespasses too far on the credulity of his professional brethren, and gives utterance to what is not strictly true.

The radical cure of hernia, then, is an accomplished fact, and must remain, with the same qualifications as when the words radical cure are employed in any other surgical operation.

The operation, another says, "may kill." Very true—and so may the simple scarification of the arm for vaccination give rise to mortal gangrene or tetanus. The extraction of a tooth may be followed by instant death or a dangerous hæmorrhage.

Dr. W. T. Bull, in the essay alluded to, in speaking on the dangers of the operation, says, "the mortality is practically *nil*.

It is interesting to note the present attitude of M. Paul Ségond, as compared with that which he occupied ten years ago, when his invaluable contribution on hernia in general, was published. Then, strongly opposing hernial operation, and conceding an operation with a view of effecting a cure of hernia seldom justifiable, except in special cases; now, after a lapse of ten years, he says: "I regard the operation for the radical cure of hernia an excellent one and frequently perform it for every species of the deformity." (De La Valeur De La Cure Radicale Des Hernias au Point de Vue Du Résultát Définatif.—Congrès Francais de Chirurgie, 1890.)

That the operation for the radical cure of hernia has attained for itself a legitimate position in the field of surgery is best proven by the fact that to-day, in every civilized country of the world, it is being performed on a large scale and in the vast majority of cases, with the most gratifying results. However, with this as with any other surgical operation, it has its limitations. In properly selected cases, it is an inestimable boon, excelled by no other in mechanical therapeutics; while in many others, it is little better than a barberous mutilation, which leaves the patient very much worse off after it than if nothing whatever had been done, or even destroys life. It would not then, in any sense, be regarded a cure-all, but only an expedient, which should be employed, only when other simpler, safer and easier methods fail.

Where must the line be drawn, between the selected and the rejected; those which are appropriate subjects, and those which are not?

In order to answer this question, it becomes necessary to first consider the different varieties of hernial disease; those which are spontaneously curable; those which may be supported by the bandage, and those which, with the advance of time, not only become more painful and uncomfortable, but are likewise more prone to strangulation. We must also examine into a diversity of factors of an etiolgical, anatomical and clinical character. Accordingly it becomes necessary, for convenience of description, to group and classify the cases.

1. Hernia in early life, under the tenth year.
2. Hernia in advanced age.
3. Male hernia.
4. Female hernia.
5. Congenital hernia, proper.
6. Acquired hernia, so-called.
7. Laparotomy-hernia.
8. Hernia in those suffering from constitutional disease.

Regional Division:—

1. Complete inguinal hernia.
2. Incomplete inguinal hernia.
3. Inguinal hernia in female.
4. Crural hernia in female.
5. Crural hernia in male.
6. Umbilical hernia in female.
7. Umbilical hernia in male.
8. Ventral hernia in both sexes.
9. Obturator, lumbar and perineal.

Division on a Basis of their morbid Anatomy and Pathology:—

1. Simple hernia, in general.
2. Incarcerated hernia.
3. Strangulated.
4. Enterocele.
5. Epiplocele or entero-epiplocele.
6. Hernia complicated by pathological changes in contigious parts.

Infantile hernia is very common, either of the umbilical or inguinal typlo. With the male infant it is, no doubt, attributable either to a maldescent of the testes, to phymosis, or to a partial atresia of the urethra.

In ectopic-testis, the organ, as it passes through the inguinal portals, the openings which its pressure effects, often carries with it a fringe of omentum. It may even cause adhesions with a coil of intestine, and lodge it in the scrotum. When neither of these

[2] Félizét, Cure Rad. des Herniæs Particuliarement ches les Enfants, p. 12.

mishaps occur, it may descend late, in intra-uterine life, so that the funicular process of the peritoneum or the rings have not completely closed; and, in consequence, we may have the congenital hernia of the anatomists, or a protrusion through the fascia-propria-abdominalis, complete or incomplete. Besides, we sometimes meet with a spasmodic condition of the cremaster muscle, or the gubernaculum, which might be aptly termed the *flitting testis*. "Now we have it, and now we haven't." A remarkable case of this description was once sent to me for operation, in a child two years old. On the left side, he had an ectopic-testis. At one time we would find the testis in the perineum; then in the scrotum, or in the inguinal canal. And, again, what seemed most extraordinary, it would disappear altogether, mounting out of sight into the abdominal cavity, to appear again, in a day or two, outside the rings. Everyone knows that when the testis is permanently arrested on its way downward, that the presence of a hernia is almost invariable.

True umbilical herniæ are quite common in babies, particularly females, during the first year. When the naval aperture fails to close in promptly after delivery, then rupture appears. There may be an excess of abdominal viscera, or the clothing is badly adjusted. Indeed, the cause of this parting of the umbilical scar doesn't always appear by any means clear in infancy. There do not seem to be any cases on record, of death from this sort of ventral protrusion in infants, nor evidence that the general health suffers in consequence of it.

The vast majority of cases of hernia in infancy, disappear of themselves by tentative measures, by the use of the bandage or truss; with restriction in physical exercise, proper clothing and dieting, before the tenth year; though later in life the majority of them will relapse again at varying intervals, after maturity. But there is a considerable number of these hernia which are rather aggravated than benefited by the retentive apparatuses; their pressure setting up an inflammation which extends down the sac, with the spermatic cord, or causes a fusion of the projected viscera, when thereafter, their return becomes an impossibility.

With umbilical hernia of the kind considered, it is seldom, if ever, that any sort of surgical intervention should be permitted, for they are usually by simple means, readily and permanently cured.

My own experience has convinced me, that every case of hernia in the child associated with ectopic-testis should be operated on promptly, for its radical cure. It goes without saying, that in infantile inguinal hernia in the male or female, a very careful examination should be always made; and when we suspect that the bladder, ovary, or uterus has left its normal moorings and passed out of the abdomen, an operation is imperative, either for their excision, or return to their normal abode. Dr. O. P. Barber, of Saginaw, Michigan, last year reported a case in which he encountered the uterus in a hernial sac when operating, (*Am. Jour. Gynecology*, Oct., 1891) and Boyer cites cases in which the herniated uterus has become the seat of pregnancy, the living infant being delivered through a large gash, made through the walls of the strayed uterus. He mentions also, several cases of large vesical calculi having been removed from the bladder, when in the same situation (*Malad. Chirurg.*, tome iv, page 207). A young lady has come under my observation who had been an invalid since her menstrual period. After an enlarged, inflamed, herniated ovary, which had been lodged in the canal-of-Nuck was removed, she promptly recovered perfect health. In any case these complicating factors discovered, require prompt surgical relief, the earlier the better.

When a truss cannot be comfortably worn, or when it fails and we have an incoercible hernia, unless the child will submit to long confinement in bed with a proper and systematic dieting, the question of dealing with the case by radical measures arises. In every case, however, we should endeavor as far as possible, to remove the exciting cause; we should perform a circumcision, free the urethra, or rectum, and adopt the simple prophylactic and curative expedient, which has been recommended by Dr. Frank Parsons, of Boston, in these cases, viz.: in all cases of infantile hernia of whatever description, always throw aside every sort of binder, which may constrict the abdominal muscles, and allow the infant the fullest possible measure of diaphragmatic movement. (JOUR. AM. MED. ASS'N. Sept., 1891.)

The hernia of the aged—another extreme of life, unless in very exceptional cases should not be interfered with. At this epoch of one's existence, the blood vessels have undergone degenerative changes, the sac has become, so inextricably blended with the elements of the cord, that its isolation is often difficult and sometimes impossible. Strangulation in the aged is a rare event. I have never seen it in one over 65 years in either sex. There is scarcely anything except this latter condition, which will ever afford us, any justification for operation in this senile state.

Hernia in the male sex, being so common and will occupy us so frequently, that it would seem, that something might be said of sexual peculiarities, in their bearing on the treatment. The chief difficulties in the way, in the treatment of male hernia, are the laborious occupations of the majority of men, and the great trouble in effectually barring the portals of hernial escape; while yet preserving the spermatic cord, from immediate injury, or from the ultimate pressure of a contracting scar. Yet, notwithstanding these drawbacks, so much relief, and to so large a number has been given, and so many permanent and enduring cures have been affected, as to not only warrant a continuance of operation, but also stimulate us, to renewed efforts, in devising means, by which they may be shortened, simplified and rendered more and more effectual.

However, every case must be seperately studied, before we can always, come to a final conclusion; not only, as to the particular operation; but, the most appropriate to each case; nor should we make forecasts as to final results in every case.

Female Hernia.—Female hernia, as it is much more rare, than the opposite variety, we have been in the past, less frequently concerned with its management. Nevertheless as womens' herniæ are commonly more painful and liable to mortal strangulation, the safest and most effectual manner of relieving them should engage our most serious attention.

For anatomical reasons, they have, but seldom, inguinal hernia; for the reason that they have practically no inguinal canal; this rudimentary passage being always completely obliterated in the adult woman and never permitting of any extraneous substance to

enter it except, in cases of congenital defect, in development.

Crural hernia is the phase with them which visceral protrusions so often take. As many of these herniæ are unmanageable to truss-support, and threaten strangulation, operative measures are not unfrequently invoked for treatment. Since laparotomy has become so common an operation, we are beginning to see a considerable number of cases of eventration, more or less of the abdominal viscera, which make their way through the weak or enclosed fascia propria, into the subcutaneous tissues, thereby constituting a sort of traumatic hernia, which I have designated laparotomy-hernia or rupture; for their affinity to laparotomies. When these are discovered and treated by appropriate pressure and support, in their early stages, much benefit may follow. But when they have attained a great volume, surgical intervention may be considered.

At the late meeting of the British Medical Association, Lawson Tait described a method of treating hernia, by making an abdominal incision and drawing the sac and viscera upward, then closing the ring from the inside with the aid of a suture. This he particularly advised to be always done when one did an operation on a woman for the removal of a tumor, taking advantage of the opportunity when the abdominal cavity is open, to extract the hernia and effect a cure. His views, in the Section on General Surgery, before which his essay was presented, met with but little support, though it was generally conceded that in these hernia-bearing women, who were to be laparotomized, the idea was a good one, in simple reducible herniæ.

Congenital Hernia.—I have grouped under this head every sort of hernia which is visible at birth. As a rule, on examining the scrotum after delivery, it will be found that boys have a scrotal development rather out of proportion, in volume, for their general development. We will always observe that the cremaster muscle is of considerable thickness and density, and that there often is a conical contour of the spermatic cord from the expansion of the fibres of the external oblique, at its external outlet, giving an impression to the touch, and the appearance to the eye, of a hernia. My own impression is, that in the vast majority of male infants born, the funicular process is not completely closed for varying periods after birth. In those where no impediments to the emunctories are found, and where the child is not taught to walk too early, it will usually close of itself during the first year; while on the contrary, under adverse circumstances, the opposite will obtain and a hernia may present. Hence, the mere fact that this funnelling is present, always more or less marked on one side than the other, is no reason that we should institute any sort of active treatment. Nature is competent to deal with this incomplete evolution. It is one of those manifestations which illustrate how often the infant reaches the world, in a sort of incomplete state of development, but in which, under a favorable environment, time will obliterate apparent defects.

There are now and then met with at birth, nevertheless, herniæ of considerable size, which are quite irreducible. Opinions are at variance as to the proper course to pursue with them. My own plan has been to recommend immediate operation, supplemented by the use of the truss. I have operated on the fifteenth day after birth, on a large scrotal hernia, and afterwards exhibited the baby before the Harlem Medical Association, the result being most excellent. And as many as a dozen I have treated by radical measures, under one year of age.

In a general way, however, unless there are some special and pressing indications, it is much better to follow the rule of Félizét, viz.: to employ first, palliative means, only, and not operate until children are over whooping-cough and measles.

Acquired Hernia, So-called?—Authors are accustomed to set down the causes of hernia, as predisposing and active.

My own experience has led me, to regard hernia of every description, as always, in *every instance*, as being attributable to so-called predisposing causes, solely and alone; to congenital ante-natal conditions; the active cause, being an incident only, and nothing more; bearing about the same relation to the infirmity, that a local injury does to a cancerous growth; hence the reason that I have intimated a doubt in the above designation.

It will be found on rigid scrutiny and a painstaking examination, in the vast majority of those so herniated, that they either had the disease in very early life, or that they had a sense of weakness at the seat of the hernia for a considerable time before it appeared. As the infantile hernia, is either undiscovered, or treated by a truss, and has disappeared before the child reaches the age of reason, he has no recollection of it, so that when it appears, only, after the lapse of several years, long after his parents have died, perhaps, he being ignorant of ever having had the infirmity formerly, he may in all sincerity deny its previous existence. Mr. Thomas Bryant in his excellent treatise on surgery; says, that the greater part of those early cases disappear, before the tenth year; but that later, when the abdominal muscles are put on a severe strain, through violent exercise or labor, they recur, in the great majority of cases. Inasmuch, as in all, which I operated upon, under one year of age, the sac was in every case, thick, tough and firmly adherent to neighboring tissues, it was evident that the *fascia-propria* had been extruded a considerable time before birth; probably contemporaneously with the descent of the testis. It is very probable, that in all those cases of cure of hernia in infants, the viscera are returned to the peritoneal cavity, the neck of the sac contracting only; hence in later life, on severe strain, its orifice is suddenly stretched and the viscera slide downward into a pouch, which awaits their advent.

It will be seen, then, that while tentative measures, serve a most useful purpose in early life, and so remedy very many hernial infirmities, that they never give any trouble, it is also evident that these herniæ constitute the ground work of the acquired, or consecutive variety later in life.

The treatment of the acquired variety of hernia, must be governed by circumstances; whether it is strangulation of very great volume, simple or complicated and other factors, which will be considered later on. It may be said, however, in a general way, that in this class, when a comfortable support can be tolerated; when there is no tendency to strangulation, in carceration or *hydrops Vaginalis* no operation is called for. These acquired herniæ, so-called, are peculiar to women; as hernia with them of the congenital type is rarely seen; for it is usually with

the advent of menstruation or child bearing that the infirmity makes its appearance.

Laparotomy Hernia.—It is said that from 25 to 30 per cent. of women laparotomized, suffer sooner or later, from hernia, through the line of incision. They constitute by all odds, the most unmanageable and melancholy phase of this infirmity, that we are ever called upon to deal with. They anatomically possess a close resemblance, with those large, massive exomphaceles occasionally met with in middle-aged, child-bearing women. Like them, their serous investment is of a purely adventitious description, as they have no true sac. As they make their way through the divided lips of the dissundered gap they, push the fascia propria aside and press on, sending prolongations into the inter-muscular spaces and under the integuments, which give rise to an irritation, that ends in a plastic inflammation. A webbing and netting of the capillary vessels follow, in consequence of which in time, the vascular structures of the abdominal walls and the chylopoietic viscera become intimately anastomosed. Muscle, tendon, ligament, aponeurosis, omentum, mesentery and intestine, become, in time, inextricably bound together. The portal through which this enormous mass escapes, very often remains of rather limited dimensions. One case on which I operated, wherein the hernial mass was larger than an adult head; yet the opening in the middle line, through which it escaped was no larger than would admit the finger. In this unfortunate class of cases, as time advances, one coil of the intestines will follow another, the mesentery so stretching as to permit the practical eventration of all the movable viscera. The economy adapts itself to this extraordinary derangement of the organs, so that, the processes of digestion are not seriously interfered with, except in very aggravated cases. Nevertheless, they practically cripple the patient and render her unfit for any occupation which requires activity and strength.

If seen, when they first appear and when they are of diminuttve volume,with few exceptions they should be promptly dealt with, by surgical operation. But, when they come under our observation, only when they have attained considerable size and have existed over many months an operation undertaken for their alleviation or cure, is attended with considerable danger to life. The necessary expansion of so large a quantity of intestine, the extensive hæmorrhage, are elements of danger, and what is the worst of all, is the calamitous effect on the respiration, caused by the sudden return to the abdominal cavity,of so large a mass. One only alternative, then, is mechanical support, such as is afforded by a bandage or a sort of sling. Certainly, in the event of strangulation, we must not hesitate, to immediately operate. But, our intervention here, has no parallel in technique, with that which we commonly resort to, in inguinal or crural hernia. Our aim should be, to simply relieve the restriction and nothing more; leaving the incarcerated viscera in their newly found abode, without making any effort whatever, to return them.

Hernia in those Suffering From Constitutional Disease.—The question often rises, when patients apply for treatment of painful, incoercible or dangerous hernia, whether, when they are suffering from organic disease,we are justified in advising radical measures; and when not, what alternative can we offer? It is well known, that many constitutional maladies often pursue a very chronic course and that not a few of them, pronounced incurable get well, when properly treated. This is notoriously the case, with the pulmonary, renal and hepatic disorders. However, as a matter of justice to our patient, unless his case is one of special urgency, tentative measures only, should be enjoined. It is a curious fact, that in reviewing the literature of hernia and recalling my own limited experience, there appear few records of strangulated hernia,in those suffering from serious chronic disease. Yet, there are, no doubt, occasionally cases in the unsound; male and female, in which an operation should not be refused. Heretofore, in renal, cardiac or pulmonary diseases, we can clearly understand why respiratory anæsthetics should be eschewed; and hence surgical measures contra-indicated. But, since the discovery of the valuable analgesic action of cocaine analegesia, this objection does not obtain. Many times have I demonstrated this, in male and female hernia; strangulated,incarcerated and reducible; with a successful issue in most cases. A hernial operation of convenience, in a delicate, sickly child or adult should never be entertained.

Regional Division of Hernia. Complete Inguinal Hernia.—As its name implies, this hernia indicates complete clearance of the two rings and the entire canal; hence we can appreciate the fact, that the cure entails its complete return, back, through the entire path which it traversed. Now, if this sort of protrusion were a sudden and abrupt event, analogous to a dislocation at a joint there would seem no reason, why it should not be treated on the same precise principles; for a hernia is always essentially a dislocation. If the capsule, ligament, tendon or muscle is lacerated or injured in a dislocated joint, after the displaced bone is restored, we place it in the best, possible position for its complete practical restoration.

In an acquired,complete inguinal hernia of the reducible type, we seek a cure, by the return, entire of the wandering structures. But, we have impediments, at times, which make their return, difficult and their permanent sojourn, in their normal abode impossible. The sac has acquired adhesions. We empty it but leave the receptacle, to invite hernial return. True, we may secure a sealing of its lumen by adhesive inflammation. The rings are abnormally wide. There is an undue lengthening out of the mesenteric ligaments and there may be a want of proportion in the capacity of the abdomen and its contents; as we see, in those cases, in which, when,we crowd back, a hernia, with a truss on one side, a fresh protrusion appears on the other. This is the phase of the infirmity, which is more managable to truss-pressure, than any other. It is only when a proper truss cannot be secured; when the hernia has attained a great size or threatens strangulation, that operations are called for here. Complicating factors, must influence our course though, as in other cases.

Incomplete, Inguinal Hernia.—Incomplete hernia or bubonocele, is less frequently seen than the complete.

Anatomically, it consists in the protrusion being arrested in its passage through the inguinal canal; or having slipped through the interior aperture, fails to lodge in the scrotal pouch. In many varieties of it, when one's occupation is not of a very laborious description, and it gives rise to no inconvenience, it should be left severely alone. It having become impacted, it so effectually blocks the passage, that

nothing can pass it. Those bubonoceles, however, may contain within them, an undescended testicle or a neoplasm; and they, through constant pressure on the spermatic cord, may cause its atrophy; or they become strangulated at the internal ring. With the greater part of them, there is a tendency to increase in bulk, if no restraining measures are employed.

They are commonly borne without serious distraint, by the use of a supporting bandage. Though there are so many sequalæ which they give rise to, in several cases, that operative measures may be occasionally considered.

Compression of the vascular structures of the cord, in time, lead to diminution in sexual power, spermatocele, hydrocele or varicocele.

Not long ago, I was consulted by a veterinary surgeon who had a small, incarcerated bubonocele, over which, he wore a truss. He was a hearty, vigorous man, of forty years and had a wife of an ardent temperament; whose demands he had not been able to satisfactorily supply, for some time, before he consulted me. He came to me believing, that I would do an operation; for, his observations on the lower animals, led him to believe, that the hernia was at the bottom of his sexual impotence.

On examination, while I could discover no positive atrophy of the testis, yet it was of a soft, flabby consistance, on the side the truss was worn; besides, its fellow was rather undersized, for a man of his stature.

The veins of the spermatic cord although not decidedly varicose, were nevertheless, enlarged and thickened. On making a very thorough examination of the hernia, I concluded that the small nodule which occupied the inguinal canal was not the bowel; and, it being firmly fixed, by adhesions making no impulse against the finger on coughing. I decided to recommend him to discontinue the truss and wear nothing whatever, except a hank of woolen yarn; and this only on any day when he had to perform laborious duties. My advice was followed with the most gratifying results in every particular. The hernia has not increased in size and the sexual powers are all that could be desired.

There are cases of this variety, of hernia, however, in which, the most astute must consider carefully, before advice is given. They must not only be very carefully examined, but thoroughly studied as well; for not only is our patient's future comfort and happiness at stake, but even his life as well.

The following case illustrates this fact.

A man of forty-two, came under my care at the Harlem hospital four years ago; for the treatment of a strangulated, incomplete inguinal hernia. His history was that since a boy of ten, he had a small, fullness in the right groin; for which, for many years, he had worn a truss. But, for more than ten years previously, to entering the hospital he had thrown the truss aside; no trouble coming from it, until now. He was married, and the father of five children.

His symptoms being urgent an operation had to be immediately performed for strangulation. As the tissues were divided and the sac opened, there, side by side, with a strangulated intestine, lay an undeveloped testis. This man was a monorchid. He never properly rallied and died two hours after operation. As his scrotum was much distended, it gave the appearance of symmetry. Had the practitioners who had first seen him recognized the true pathology of his condition, instead of making prolonged and futile taxis; or had they advised operation twenty years earlier, he undoubtedly would have completely recovered from operation and have been cured of his hernia as well.

Hence, in these cases, before we pronounce an opinion or specify the line of treatment, to be followed, we should, in every instance, be assured of the presence or absence of the testes. If both testes have descended, then we may, in all cases, with few exceptions depend on tentative measures. But every time, when we discover a bubonocele of any considerable size and that the testicle is absent, on that side, the organ should be cut for, and forthwith removed; at the same time executing the technique for radical cure. It may be well, to not forget, that operations for bubonocele are not so satisfactory, in their permanent result, as are many other herniæ. The pressure of a large mass against the abdominal wall, over many years, causes a thinning and wasting of the aponeurotic structures, which, when operated on, possess a low vitality; so that in many of those, we operate only when we must, for strangulation, for example; or, to put the hernia in a more supportable position. I am not certain, but in many of those cases with ectopic testis, an incision for its removal without any unnecessary mutilation, would, in the end, accomplish as much, durable good, and less danger to life; than an operation of a more tedious and dangerous character.

Direct Inguinal Hernia.—The diagnosis of direct inguinal hernia is a physical impossibility. It is true that by the aid of the scalpel and a delicate dissection, it may be made out; but, not by any other means. I have never met with but one case, which, I was quite assured, was a hernia of this type, at the time of operation. My conviction is, that it is a very rare pathological entity. Indeed, in those old inguinal herniæ of considerable volume, in which the inguinal canal becomes quite obliterated and the hernial vent, is simply a large hole, in the aponeurotic wall, it doesn't seem, by any means clear to me, how even on dissection, the differential diagnosis of the direct, from the indirect, is possible. Indeed, I would deny its possibility. Anatomists would tell us, that the one, should be readily recognized, from the other, by its coverings. But, we are not dealing with normal structures. They have undergone such pathological changes that the investing layers have become greatly changed in their histological elements; atrophied, hypertrophied; or fused together by adhesive inflammation.

Happily, it is of little consequence in treatment, except in operation, when we are told, that in the direct variety, that as the mass comes down to the inner side of the epigastric artery, the edge of the scalpel must be carried in a certain direction, if we would avoid a dangerous hæmorrhage. Those anatomical refinements are of little consequence, when we come down, to the act of operation.

The direct, complete inguinal hernia, when of long standing; when the outer walls of its sac have become firmly bound down to the cord, when the testis and perchance the contents of the sac have become adherent to its inner serous surface, and a large breach is made through the abdominal wall, we must always consider, it as an infirmity of an inoperable description; which can never justify surgical intervention, except, in the event of a strangulation. If the interpretation of this hernia is correct and it has been properly defined; then, even though no adhesions were present, the excision of its dense, tendinous sac; leaves a hiatus in the abdominal wall, liable to lead to unfortunate consequences ultimately.

Inguinal Hernia, in the Female.—It is said that inguinal hernia in the female, is about as rare, as

femoral, is in the male. The morbid anatomy of female, inguinal hernia, is comparatively simple. The presence of the vascular supply of the testicle, coursing through the inguinal canal in the male, gives rise to a multiplicity of painful complications; and their absence, in the canal of Nuck, in the female renders this form of hernia with them, seldom a source of much inconvenience, except in the marriage state.

At the crest of the pubic brim, the parts being so deeply covered with fat and hair, a hernia unless of considerable volume, or morbidly sensative, is apt to be overlooked and the patient may go through life, without a suspicion of its existence.

Inguinal hernia then, in the female is devoid generally, of those attributes which cause so many painful concomitants; as they are commonly small in volume; and when reducible are easily coercible. However a large number of them are painful, and quite rebellious to treatment by the truss. They may be reduced and pressed backward by this instrument, but they cause so much uneasiness and misery that the patient often feels much more comfortable without any sort of mechanical aid and throws the apparatus aside. This is explained, by the fact, that in female inguinal hernia, any single one in part, or complete, of the genital organs may occupy the sac and constitute the protrusion. If one of the reproductive organs has not come down, directly; the omentum in its descent, having formed adhesions with some one or more of them, or their appendages causes all these symptoms, which we might any time look for in ovarian or uterine displacements. Such was Dr. Barber's case, which had baffled medical attendants. Not being able to find the uterus, on vaginal examination and discovering that his patient had a large, unmanageable inguinal hernia, he decided to operate, when he found the entire uterus, wholly outside the abdominal cavity; bound down by old adhesions to its peritoneal investments. The doctor then proceeded to secure a radical cure, by resecting the uterus and closing in the chasm. (*Am. Gyn. Jour.*, Dec., 1891.) Dr. Perry Schoonmaker exhibited before the Harlem Medical Society of New York, in March, 1892, a year old female infant who having a large unmanageable inguinal hernia, he cut down, on it and found it to consist of a prolapsed ovary. The doctor practiced the most praiseworthy conservatism. Freeing it from its attachments, he returned it to the peritoneal cavity and effected a permanent cure of the infant. For other reasons, besides those enumerated, in the vast majority of inguinal hernia in females; as soon as the hernia is discovered it should be treated by prompt, surgical measures. Strangulation in the female is terribly mortal. Very much more so than in men. A curative operation prevents the possibility of it occurrence.

Each successive confinement is almost certain, to aggravate the infirmity and increase its volume. The canal-of-Nuck, through which the viscera escape in women, can be, without endangering any organ, solidly, hermetically sealed up and very possible prospect of permanent cure offered. To the young woman contemplating matrimony, in order to remove the blemish and infirmity of hernia, an operation should in every instance be recommended. Applicants are admitted into the cavalry arm of the British service after they have been cured, by surgical operation of their herniæ; who had been previously rejected. As a prothetic measure then, in addition to others, the simple, safe and efficient operation of kelotomy, may, in every case of inguinal hernia, in the female be taken advantage of; as offering in the greater part of them, everything that can be expected. The unfortunate young woman, heretofore aware of her infirmity, is conscious of her physical inferiority, bewails her misfortune and dreads the approach of the time, when she can no longer conceal its existence and she is open to the charge, of having been physically unfitted for the married state. Surgical intervention in her case, instituted under proper environment, is devoid of peril and the operator who carries his incision well over the lateral slope of the *mons-veneris*, being cautious to limit its extent, will so completely obliterate every trace of the scar; which, will be effaced by the re-growth of the pubic hair. The earlier in life the operation is performed the more complete, will be the assimilation of the cicatricial tissue and the total disappearance of the former deformity.

Crural Hernia, in the Female and Male.—Femoral hernia in the adult female is the most common of all varieties. For many anatomical and physiological reasons, operations for its effacement are very often unsatisfactory and are frequently followed, by relapse; so that in only exceptional cases can they be regarded, as appropriate adjuvants in the way of cure. Hence, it is in only the minority of them, that active surgical interference is demanded. But, these are sufficiently numerous to always warrant a careful study of them, before we attempt their cure or relief by any therapeutic resort, which entails the loss of blood. The great obstacles in the way, in treating female, crural hernia are, the presence of the two great blood trunks, of the lower extremity, which pass immediately through, or are in close contact with the common hernial sheath, the *fascia propria;* and, with the married female, the recurring strain of parturition; the varying volume of vena-saphena; and, puerperal phlebitis in the veins of the lower extremity.

Many times, in operating on femoral hernia, particularly in the strangulated variety, have I met with such close and intimate fusion of the walls of the vein with the sac, that it required a very delicate and tedious dissection to separate one from the other. On one occasion, while making such a dissection, in a femoral-epiplocele, I accidentally, opened into the femoral vein. Moderate pressure, however, easily controlled it and a permanent cure resulted. When, after considerable time, the saphenous opening in the fascia-lata, has attained to increased dimensions, the femoral curve is practically effaced, and nothing remains, but a large ring. In cases of this type, the permanent closure of this large portal, in such a manner, as will prevent the viscera, again slipping down, under the crural arcade, during the strain of active labor, is impossible. In any event, extreme caution must be always observed here, while endeavoring to close the vent, not to excite so much inflammatory reaction as will cause such pressure on the vein as will in any way interfere with the free return of the blood, from the lower extremity. The great difficulty in accomplishing this, constitutes one of the almost insurmountable impediments to the more general adoption of operations for femoral hernia.

Which then, are the cases of femoral hernia, that may render operations on them, imperative? They are in epitome, those of strangulatior the incoercible and the painfully incarcerated.

In my experience, operations for strangulated, femoral herniæ in women are by far, less fatal, than for inguinal, in the same sex.

By incoercible, is meant those herniæ, in which a truss cannot retain the hernia with comfort; and, there is a tendency to symptoms of impending strangulation. Here, clearly, where life is imperilled, or made wretchedly miserable, there is scarcely any middle course; and, if there are no pronounced contra-indications surgical relief should be immediately resorted to; for, even if permanent cure is not secured, danger of death from strangulation is forever obviated; and besides the protrusion is so placed, as to be comfortably supported, by a truss.

We should be guided by the same general principles, in the treatment of femoral hernia in the male, as in the female; except, that owing to the wide physiological difference in the pelvic functions of the two sexes, hernial operations, for this phase of the infirmity offer much greater prospects for successful results in males. Nevertheless, when a femoral hernia occurs on the same side as extensive varicosity of the saphenous vein and its tributaries, we should hesitate, and weigh well the consequences, before we resort to any procedure which may, in any way, embarrass the free flow of the veinous current through the great trunks in the ham.

Umbilical Hernia; Exomphacele, Median-Ventral Hernia.—I have seldom seen umbilical herniæ in the adult male; although I have met with a considerable number in the matured, child-bearing woman.

In approaching the consideration of the treatment most appropriate, in this class, we must constantly bear in mind the morbid anatomy and clinical history of umbilical hernia; its causes, and the conditions which favor or retard its cure. In those naval protrusions so commonly seen in early infancy, which give rise to no serious symptoms and which disappear of themselves, any sort of cutting, to efface them, is little short of a downright mutilation. Impediments to the free passage of the urine, whooping cough or measles may retard their disappearance, but, as age advances and these incidents are passed, the erratic visceras return and the orifice contracts, so that, as a rule, from the tenth to the twentieth years, we will very seldom see this genus of hernia. After they once disappear in the boy, it is very rare that they return. With the female, on the contrary, they often, again, make their appearance, not uncommonly, giving rise to embarrassing symptoms, and often, even menacing life itself. We have seen, that these herniæ spontaneously disappear in infancy; but, in adult life, they occupy a fixed position, in most women, in whom their tendency is rather, to increase than diminish in volume. Certainly, dangerous eventualities may occur, depending in a large measure on recurrent pregnancies and the occupations or position in life, of the afflicted. This being the case, one would on superficial examination of the subject, assume that the return of the wandering viscera, with the simple closure of the outlet, should be the proper course of treatment in every case. It is as a rule, however, unusual, that they give rise to any serious inconvenience; hence the patient would be quite ignorant of their appearance, if she did not see them. With these, the simpler, the treatment, the better; and, it should be directed, as much to the mind, as to the hernia. The assurance, that the slight fullness will probably, never give any trouble; the application of a light, soft belt or binder are ample; with a caution, to avoid any sort of heavy straining; are all that is necessary with this minor class.

The most serious cases of so-called umbilical hernia, however, are rather ventral, than umbilical; *i. e.*, they make their escape from the abdominal cavity, rather above, below, or on one side of the naval aperture, than through it; and, instead of pushing an investment of the peritoneum before them, they rather, by pressure or otherwise, rend this membrane and pass through; hence, are genuine properly so-called; and, in consequence have no true sac, but rather an adventitious investment of areolar tissue.

In order to have an umbilical hernia proper, we must always have the elements of the urachus and round-ligament of the liver, outside the abdominal wall; a very few cases of which are recorded in surgical literature.

Herniæ of this description may attain an enormous size. I saw one lately in a young widow of 35 years, which contained the greater part of the floating viscera; and, which hung down over the pubis. It in no way interferred with her general health; and produced no visible deformity under her clothing. It was supported by a sort of sling belt. Regardless of their size or situation, nevertheless, these herniæ when free from severe pain, or prospect of strangulation, they belong to the inoperable class. The proximity of their situation to the great, central ganglia of the sympathetic, the solar plexus, the usual abundant and intimate adhesions of a heterogeneous character, the muscle sheaths, aponeurosis, mesentary, omentum and intestine, always makes this separation, isolation and return of the extended viscera, a very bloody, difficult and always dangerous procedure. Besides, what is worse than all, the calamatous consequences, liable to follow, the sudden increased intra-abdominal pressure, occasioned by the immediate return, of a mass so long lodged externally, that it practically becomes a foreign body. It has long been observed that the sudden evacuation of a serous cavity is not a harmless measure; and, *per contra*, the abrupt distension of any of them, is always a menace to life. So that, should we meditate a radical operation, we should always commence, by endeavoring to effect the gradual return of the viscera by taxis, and then, when it is evident that tolerance has been attained, we may essay, a plastic operation to close the vent. But, as the greater part of them are incarcerated, we are not able to avail ourselves, of this expedient.

It is only then, in those ventral herniæ, in which the patient is menaced by strangulation, or that they make life unbearable, that a capital operation for their cure, is at all, a permissible expedient. Exigencies will, though, arise, when the surgeon must be prepared to act; and, even in these unpropitious cases, be prepared to promptly interfere and save life in strangulation, in the umbilical region; or in the less serious, do so much as will give comfort and remove all apprehension of future danger, from strangulation. When these herniæ are attended with periodical spells of colicy pains, are incarcerated and painful, the practitioner must be on his guard, for symptoms of strangulation. I saw a case of this type of hernia, during the past year, in which, through failing to recognize it, until too late, a life

was lost. The patient, the wife of a physician, had the hernia 30 years. When I saw her in consultation and recognized her real condition, she was having stercoraceous vomiting and was in a collapsed condition, presenting such a hopeless aspect that I deemed an operation inexpedient. Last October (1891) a woman was sent to me suffering from periodical fits of strangulation in an umbilical hernia. Although her hernia was as large as the fist and there was free hæmorrhage; she made a good recovery, after operation and so far there is no sign of relapse.

Division of Herniæ on a basis of their morbid Anatomy and Pathology. Simple Hernia in General. In Youth.—Under this head, I have grouped all herniæ found in such a position, of such a size and situation, as to give rise to no inconvenience; immediate, or remote; and, which, are devoid of any serious complicating factors.

The human offspring, at the time of birth, has but partly effected its evolution; imperfection physically, at this epoch, of life is the rule. The position which the symmetrical organs occupy, bears but little or no relation to what they will later in life, at the mature stage. Want of coördination and symmetry is now observable on close inspection and many conditions are now observable, which might at first, be regarded as malformations, are but slight deviations, which it was not allowed Nature to complete, before the child was borne into the world; but which time will remedy, provided the offspring survive. These defects, one will most readily observe, in the arches of the jaws, the outlines of the spine, the position of the limbs, and the varying relative size and contour of the cranial and facial appendages, particularly the nose and its septum. With these must be added those simple herniæ, in which, in the absence of coughing or unusual straining, with the infant in the dorsal decubitus the greater part of the time; in the first year, they commonly disappear, as the formative processes advance.

Strangulated Hernia.—Strangulated herniæ, until very modern times, were always, first treated by the tentative means, before radical measures were resorted to. In our own times, there are not a few cases, in which we must follow the same course; but one of the great difficulties, in the way, is, not being able to always say with certainty, what the immediate results of an operation will be.

In the greater number of strangulations we will have such pathological conditions as generally call for immediate relief. They are, pain, inflammation and obstruction of the bowel. In some, we may have the bowel constricted for days and then reduced without serious detriment. While there are other cases presenting mortal symptoms, after a few hours. If we could always promise recovery from operation and a permanent cure of the hernia, we should in every case, at once, cut down on the hernia. But we can promise neither. I have seen many patients die from shock, after operation for strangulated hernia. Certainly, when we do cut them, we should always simultaneously, do the radical operation, for cure.

Those patients so afflicted, accordingly, will be treated by palliative and direct surgical measures. In the old, infirm, we should endeavor to relieve by taxis first. Taxis has its limitations; and, when not skilfully applied, does more harm than good. Hence, when one has used moderate force and failed, unless the patient stubbornly refuses surgical interference, he should desist, and advise liberation of the construction with the knife. I am not sure, but in a large number of cases of reducible hernia, which become strangulated, the patient's prospects would be vastly improved, if topical application alone, were depended on, with complete rest and sufficient morphine to reduce pain, the hernia left to the patient himself to deal with, rather, than to the employment violent and misdirected taxis. It is commonly the experience of hospital surgeons, to meet with cases, in which, the outside practitioner, having exerted himself, in vain, in oft-repeated efforts at taxis and finding symptoms of collapse setting in, sends the case in for operation, at the eleventh hour. Two such cases have come into my service, which didn't survive an hour after they were admitted; one an old man and another, a young woman.

As the operation for strangulation is not a difficult one, and the mortality is very slight, when performed early, we are justified, in almost invariably, advising it, when moderate taxis fails. I am acquainted with no case of restrangulation in any one who has been operated on previously. On the other hand, a case temporarily relieved by taxis is liable any day to again, place the patient in the same peril. Further, although we certainly are not in a position, to guarantee, in every case a permanent cure, when the radical operation is performed, yet, we may assure our patient with every confidence, that the chances are against relapse of the hernia. I can find no statistics on this particular question of recurrent hernia after operation for strangulation; but, in twelve or thirteen operations for the strangulated condition, in my own practice, hospital and private, within the past three years, when I have conjoined to the relief, radical measures for cure, not a single one, to my knowledge has relapsed. and in every instance, the double purpose was accomplished of relieving the strangulation and curing the patient of his painful infirmity. Since the introduction of cocaine analgesia, into surgery when employed by myself in those cases of terrible depression of the vital powers, there have been no deaths; while with the same class, when pulmonary anæsthesia was employed, formerly, the mortality had been considerable; many dying before the effects of the anæsthesia had quite passed away. With those patients who have a horror of being rendered unconscious and are restrained from operation through this fear, no doubt very many would cheerfully submit, if they thought, they might be effectually relieved, in the full possession of their senses, without the infliction of pain. A full knowledge of the powers of this invaluable drug, in hernial operations will no doubt, tend to the much greater frequency of prompt and efficient surgical intervention, in a class, heretofore, reluctant to avail themselves of the great value of the operation for radical cure.

Incarcerated Hernia (of every Type).—The morbid anatomy of incarcerated hernia furnishes us, with an excellent illustration, of the very best work which unaided Nature can perform, in the way of protecting a condition, against accident which an imperfection, in her own processes has caused. And, when the term incarcerated hernia is employed here, it is intended to portray only, that type of hernia, which is held *en masse*, outside the portal, through which it has passed. For, there is scarcely no hernia, (if we except those, which make their appearance and are

strangulated simultaneously) that have a peritoneal investment, but are in part incarcerated. We may designate them reducible; but, they essentially are not. *In all old hernia, and, the congenital variety, as well, the sac is invariably bound down by adhesions, is irreducible and hence, is incarcerated.*

An incarcerated hernia maintains an independent existence. It forms new alliances and draws its sustenance from extraneous sources for the main part. By plastic inflammation, it becomes on its surface, and in its center, practically independent of the general, visceral, vascular supply, and is supported by those vessels, which course over its outer aspect, in the periphery, or the areolar tissues.

They are practically of two varieties only; viz.: those which are small, solid and devoid of impulse on coughing. In many particulars this group is harmless, in themselves. They need no truss to control them; for so large an amount of dense, fibrous tissue has been thrown out about them, as to firmly hold them in position. They cannot become strangulated; because there is nothing to strangle. It is then, only, by the enlargement of a passage that their presence maintains and permits a loop of intestine to engage in it; and that they can ever occasion danger. My impression is, that with the great preponderance of them, they are wholly congenital; or else are caused by the malapplication of a truss, which, by its irregular, or undue pressure excites inflammation. When they are of diminutive volume, there can scarcely be a question, but they are not infrequently obliterated by absorption; when so little residue of them remains, that in the inguinal variety, in the male, at any rate, they cannot be isolated from the elements of the spermatic cord. The other variety, is the most numerous and troublesome. They are of considerable size and include intestine as well as hypertrophied omentum. The pouches which contain them, often attain a great volume; especially the umbilical and scrotal types of them. They constitute one of the most lamentable phases of hernia. While the larger seldom immediately endanger life; yet, as they cannot always be relieved, or effaced by art, the victims of them are doomed to pass their days in constant discomfort, the hideous deformity, which cannot be concealed, remaining, to further embitter their existence by inviting the curious gaze of those, unaccustomed to see such deformities.

With this latter type, of incarcerated hernia, nothing can be promised by operation, except in cases of strangulation, where the surgeon must limit his intervention to relieving the constricted neck, unless, the presence of gangrene in the eventrated mass is suspected.

With those, first described in this class of hernia, unless this innocent extension interferes with the nutrition of an organ, or contiguous parts; as by pressure, nothing whatever should be done. I am quite confident that with them, the ordinary truss is only a source of discomfort and nothing more. But, when, as in inguinal hernia, we see the testis undergoing atrophy in consequence of the pressure they cause, or we suspect a twist in the spermatic cord and want to release it, the inguinal canal being opened, we may take advantage of this opportunity to cure the hernia. With these exceptions these innocuous incarcerations should be left alone.

It is only with the incarcerated of intermediate size, into the composition of which, the gut enters, that the question of operation rises and it is in these, that the most brilliant results are observed after surgical intervention. Operations on this variety of strangulated hernia, are prophylactic, palliative and radical. They are principally prophylactic, when we resort to them, to prevent an impending strangulation, or to obviate the tendency, to their enormous increase in volume; as in umbilical or ventral hernia. They are palliative only, when we aim to simply return the bowel and place the hernia; so that a light truss may safely control it.

They are operative, when the hernia is of the congenital type, anatomically; when the testis and abdominal viscera, lie in the same, common envelope, and all, have been welded together, by adhesions; when the abdominal contents can be restored; when a sac is present it can be isolated from ths cord and excised; and, when the inguinal outlet can be completely occluded. Irreducible crural and umbilical hernia will be managed on essentially the same principles, as the inguinal type.

It may, indeed, be said, that if those incarcerated herniæ, which manifest a tendency to rapid increase, are not treated promptly by operation, the time soon passes when interference, will be attended with success, or even permissible.

Enterocele and Epiplocele.—A knowledge of the anatomical components of a hernia will go a considerable way, in enabling us, to form an estimate of probable results of operation, and besides a correct interpretation of their condition, will suggest the best line of treatment.

We know, for instance, that a mere spasmodic grip on the neck of a mass of omental fat, an epiplocele can do no harm; but, on the contrary, by reducing the blood supply, it may effect such atrophic and degenerative changes as will in time, practically efface the hernial tumor. We know too, that when we cut for the cure of a hernia, and it is an epiplocele, by excising it high up, a relapse is impossible; for the reason, that the cause of the hernia, has for all time, been removed. With a strangulated intestine, the local and general symptoms are of a startling character and, if unrelieved, are inevitably fatal, in a very short time.

No operation has been or ever can be devised, which will always, or even in a small minority of cases effect a radical cure of an enterocele when of any moderate volume; for its cause yet remains. Its own excessive length or dimensions have not been reduced, nor, has the mesenteric ligament been shortened by operation. When the mass is of a mixed character, partly omental and partly enteric, however, we may secure a permanent cure by excision of the sac.

This difference is important to always bear in mind, when we are undecided, as to which course to advise, and when the patient demands an assurance of probable results. An operation on an epiplocele then, is always a simple, safe and curative measure; while on the bowel, it is not so free from danger and is always of dubious value, as a measure of permanent relief from hernia.

Having had no experience with unusual and rare descriptions of herniæ, as perineal, obturator or lumbar; and, besides, believing that views on the most appropriate management of them, based only, on knowledge, gathered from the text-books and theoretical notions, would serve no useful purpose, I have

purposely omitted their discussion. Nor, have I entered into a detailed description of the complicating factors and multiplicity of abnormal deviations of an anatomical type, which are commonly met with in the hernial diseases, here considered, feeling, that while endeavoring to condense as much as possible, rather, too much space, has been occupied. And further, for the reason that as my opportunities for observations continue and time will permit, the description of these, will later, engage my attention.

CONCLUSIONS.

Although during the past fifteen years, very much has been written on hernial operations; much in America, but more in Europe; so far as can be learned in the current, home and foreign medical literature, no one has made an attempt in a methodical manner, in any brochure or treatise yet published, to systematically describe and classify those herniæ which are operable and those which are not. For the purpose, of at least, in part, filling in that gap this essay is offered.

In epitomizing the subject and considering the question of treatment of hernia in a general way, it may be said, with definite certainty. * * * *

1. That inasmuch as no operative scheme yet devised, or even can be, will always effectually remove the causes of every species of hernia; in consequence of this, a permanent cure, is out of the question, in certain cases.

2. The radical cure of hernia may be regarded as one of the most satisfactory operations in surgery. The fact that the disease often relapses, constitutes no valid objection against surgical intervention; for this is commonly the case in the major part of operations performed on the human body.

3. A radical operation for a non-strangulated hernia, which gives no serious inconvenience is not a justifiable procedure and should not be encouraged, unless there are pressing reasons for it, as the presence of a neoplastic growth in it; a prolapsed ovary or other viscus.

4. Hernial operations should not be performed in extremes of age. In very early life, there is seldom pressing necessity for them. In very advanced life, the risk, immediate or remote, to life or health, involved by operation more than compensate in the prospective benefit.

5. Unless, there are especially contra-indicating factors in given cases, inguinal hernia in women should be always treated by a radical operation, which, with them, is so often attended by a permanent cure.

6. As a rule, all operations on reducible, or incarcerated herniæ are radically curative, though the disease commonly relapses; nevertheless, the immediate danger of strangulation has been removed and the hernia has been placed in a position, to be more comfortably borne by a truss.

7. Every operation for strangulated, inguinal hernia, should always include, such additional steps, as will effect, thereafter a complete obliteration of the inguinal canal but permit the passage of the spermatic cord and, remove the chances of a hernia again occurring.

8. Very large, old herniæ, in any of the abdominal regions are not operable; except, in the event of strangulation; as their return, is attended, frequently, with mental consequences.

IS AMPUTATION EVER INDICATED IN COXITIS?

Read in the Section of Surgery and Anatomy, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June 8, 1892.

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I have no intention of describing the methods and dangers of amputation in the hip-joint, but simply to inquire into its indications in coxitis. That it has often been done we may learn from the table in the International Encyclopedia of Surgery. 276 had the operation done on account of disease, 65 of which, at least, had coxitis and many of which had been previously resected. Ashhurst gives a table of 34 cases of primary and 31 cases of secondary amputations for coxitis (probably the same 65 cases mentioned) with a mortality of 31 per cent. He states that the mortality is almost exclusively due to constitutional conditions and very little dependent upon the management of the wound.

Primary amputation for coxitis will, of course, be abandoned as surgeons, little by little, learn the indications for excision and also, that done at the proper time, this operation is not dangerous and the results quite excellent. It is, therefore, only with secondary or consecutive amputation that we have to do, the indication for which, according to Ashhurst, occurs, when after excision the discharge increases and it is evident that caries has recurred and is too extensive for spontaneous recovery, re-excision or, when with the same conditions, the patient's general health begins to fail.

We may properly ask, what the cause is for this increased discharge and the recurrence of caries? The increased discharge depends probably in all cases on improper antiseptic precautions and on the imperfect extirpation of the tuberculous capsule, pieces of which have been left behind, and it may be prevented by exercising due care in this regard during the operation.

The recurrence of the caries is probably less a recurrence than a continuation of the original trouble, particularly in the form of a chronic osteomyelitis in the shaft of the femur, and it is about the treatment of this particular affection that I wish to offer a suggestion in this short paper.

In some of my earliest resections for neglected cases of coxitis I have occasionally found a chronic osteomyelitis and osteitis extending all the way down the shaft of the femur to the lower epiphysis. The periosteum was found thickened, swollen and so easily loosened from the congested and osteoporotic bone, that the whole shaft could be forced out of the wound, leaving the periosteum intact like the finger of a glove. Necessarily we would in such a case find continued suppuration and recurrence or rather continuation of the carious process, unless we removed the whole diseased shaft, in which case, if we succeeded in healing the wound, we would get a useless flail-joint.

It is obvious that to make a resection and leave the diseased bone behind is useless, and to remove the whole diseased shaft produces a useless limb. Amputation has so far been the only resource and the various text-books on surgery recommend this proceeding under the circumstances mentioned.

And yet, by a very simple, easy and reasonable

operation we are able to overcome this complication, if I can judge from a couple of cases lately operated.

Case 1.—Augusta P., aged 11, entered the Sisters' of Charity Hospital on February 12, 1892, with the following history: When six years of age she fell down stairs injuring left hip. She has since complained of slight lameness until last May (1891), when it increased, accompanied with fever, pain in the knee, emaciation, etc. Left leg abducted, flexed and rotated outwards; marked lordosis and crepitus in joint. A large cold abscess over anterior part of femur.

The abscess was opened by incision, four inches long, the tuberculous membrane removed with sharp spoon, the wound closed with sutures. It healed by first intention and gave no further trouble. The joint was thereafter resected by posterior incision, the bone being cut through above trochanter minor. The head was found loose in the joint, the synovial membrane of which was tuberculous and was removed. The whole neck and trochanter was in a state of chronic osteitis, no particular primary lesion being found. A chronic osteo-myelitis was found extending down through the shaft to the lower epiphysis, the cavity being found filled with tuberculous masses, softened bone and fluid fat. The periosteum was swollen, thickened and could with ease be detached from the dark red, congested bone. I decided to treat this complication in the same way as I would treat acute osteomyelitis and therefore removed the whole marrow and all the softened bone with a long sharp spoon, made thereafter with a chisel a counter opening into the cavity of the femur above the external condyle near the epiphyseal line, brought a strong piece of silk thread through by aid of a long probe, and after a thorough disinfection of the cavity with corrosive sublimate introduced by aid of the silk thread a long mesh of the iodoform gauze through the whole femoral canal and out through the resection wound. The acetabulum was thereafter plugged with iodoform gauze, the wound partly sutured and antiseptic dressing and a Volkmann's sliding splint with 5 pounds weight applied. The wounds were dressed every six days under narcosis for four weeks, a new mesh of iodoform gauze being introduced each time by being attached to the old one before it was removed. As the wound then looked perfectly healthy, the mesh was omitted and the wound then closed rapidly. The extension was discontinued on April 15, a plaster cast applied on May 4, and on May 10 she left the hospital on crutches in excellent health, having gained 12 pounds in weight. The shortening was one inch, the joint firm and freely movable, all wounds healed. She will not, of course, for three or six months be allowed to use the limb.

Case 2.—Thomas M., aged 13, entered the Sisters' Hospital on March 17, 1892, with the following history: He began to complain in April, 1890, of pain in the left knee, limping, had fever, starting pains at night and emaciated rapidly.

A plaster cast was applied by an orthopedic surgeon and allowed to rema'n on for three months, the child meanwhile walking on crutches. An abscess was then found on anterior part of femur and lanced, but did not heal. He continued under same treatment till July, 1891, and had since then been wholly neglected.

On entering he was extremely emaciated and anæmic, walked with two crutches. Left limb adducted and flexed, apparent shortening with marked lordosis. A sinus was seen in Scarpa's triangle discharging curdy pus. Under narcosis the sinus was enlarged and was found leading to the joint, which was then resected by posterior incision, the bone being severed above trochanter minor. The joint was found in a state of chronic arthrotitis, but not tuberculous, the cartileges being more or less transformed into a fibrous tissue forming strong adhesions and making the removal of the head quite difficult. The neck and trochanter were found in a state of chronic osteitis with formation of a number of cavities containing tuberculous material and bone-detritus.

The same condition was found extending through the shaft of the femur down to the lower epiphysis. The marrow was removed with sharp spoon, a counter-opening made as in the previous case near the lower epiphysis, the cavity disinfected and an iodoform-mesh introduced. It was changed once a week for five weeks and then discontinued as the wound looked perfectly healthy.

The wounds then closed rapidly. The patient has greatly improved, gained considerably in flesh. There is a good firm joint with free motion, shortening 1¼ inch. He has not been allowed to get out of bed yet.

Since operating these two cases I have found a similar treatment advocated in the *New York Medical Journal* of April 23, 1892, by Dr. C. T. Poore, of New York. He found the conditions described in 21 cases. In 11 cases he cleaned out the central cavity, introduced after disinfection a drainage tube in the counter-opening and the result was nine recoveries and two deaths, one 24 hours after the operation from shock, another three years afterwards from amyloid degeneration. Of 10 cases, in which the central cavity was not cleaned out, eight died and two recovered. In one of the eleven cases the whole shaft became enlarged, but has never given any discomfort.

With these results in view is it pertinent to ask, whether amputation is ever indicated in coxitis?

Discussion opened by Dr. Ridlon, of Chicago, who said that unquestionably in the majority of cases, the disease began outside the joint, in the bone and the difficulty of locating the focus of the trouble, raised the question as to whether it was best to operate or await the results of local treatment. Of course, if the patient is growing worse, operation is indicated, but otherwise, unless we can be sure we can remove all the diseased tissue and cure the case without relapse, within the time in which wounds usually heal, it is a question whether the operation should be done and the chances taken of septic infection through the sinuses leading into the joint or into the surrounding healthy tissue. His prejudices were against operating unless as a life saving measure.

Dr. Andrews, of Chicago, thought that in a large proportion of cases, after suppuration has commenced excision will be the best way out of the difficulty, though this may not be absolutely necessary to life, as has been shown by cases that have done well without excision. Such cases, however, recover more quickly after operation. Before the age of puberty there is very little danger from shock. He favored increased employment of operative procedures, but there are exceptions to all rules.

Dr. Mynter ascribed his excellent results to the great care with which he removed every portion of the diseased tissue, and also the fact that he did not try to get primary union and did not want it as he believed the wound did better if packed with iodoform gauze and allowed to granulate, as strong fibrous tissue then was formed and flail-joints avoided.

THE CREMASTERIC REFLEX IN VARICOCELE.

Read before the Section of Surgery and Anatomy, at the Forty-third Annual Meeting of the American Medical Association, at Detroit, Mich., June, 1892.

BY THEODORE A. McGRAW, M.D.,
OF DETROIT.

I wish in this paper to make a short mention of certain observations and theories which I am not yet prepared to publish in full.

The accepted theory in regard to the causation and pathology of varicocele had never been entirely satisfactory to the profession. While it may be admitted that certain anatomical relations more especially of veins on the left side of the body may predispose to the disease, and while there can be no doubt of the occasional agency of injuries and venereal excesses in producing it, we must nevertheless acknowledge our ignorance of the exact pathological processes which lead to its development. We cannot explain why of two men of apparently similar constitution and habits of life one should suffer from the disease and the other escape. We may accept as the truth, the statement that the size, winding course and numerous anastomoses of the veins near the testis, their lack of support by the loose and inelastic tissues which surround them; the length and small size of their efferent trunks, the perpendicular course

of the left spermatic vein and its right angled junction with the renal and its position under the sigmoid flexure render these veins especially liable to over distention and resulting disease. We may also agree that general debility, sprains, violent muscular exertion and excess of venereal excitement, conduce to the production of varicocele, and yet we have still to account for the fact that multitudes of men whose anatomical formation is precisely similar and who are subjected to the influence of all of these so-called causes, go through life nevertheless untouched by the disease. In other words, the alleged causes of varicocele do not in most people, produce varicocele, and unless we are willing to rest satisfied with the vague and unmeaning word "predisposition," we must confess that the essential factor has, as yet, escaped recognition. While we may admit that the particular conditions enumerated above, may influence though not in themselves determine the production of varicocele, there are other alleged causes which must be denied as not proven. Thus the often quoted absence of valves in the spermatic veins, is said by Curling, never to occur. He invariably found the valves to be present even though useless from over distention and enlargement of the veins. Whether the spermatic veins could be rendered varicose through the agency of muscular contraction or by the presence of hernia, tumors, trusses, abdominal belts, and the like must be regarded as more than doubtful.

It has seemed to me that certain pathological influences which affect the circulation of the blood through the spermatic veins have been too little studied in this connection. If we examine the theories which have been promulgated in respect to this disorder, it will be found that certain factors in the local circulation have apparently been altogether overlooked, although they have a most important bearing on the subject. If we omit all considerations of those factors of the circulation of the venous blood, which are common to the whole system, such as the action of the heart and diaphragm, atmospheric pressure and the like, we may say that the local venus circulation is furthered by three agencies: 1. The contractian of the venous walls. 2. The action of the nervous system, and 3. The intermitting pressure exerted on the spermatic vein by the contraction of the muscles which surround them, or are in their immediate vicinity.

In the walls of veins, like those of arteries, there are both longitudinal and circular muscular fibres and elastic tissues. These permit the veins to dilate under the pressure of the column of blood and to contract again, forcing the blood onwards. As long as the venous walls retain their tenacity, their contraction will form a most important element in the propulsion of the contained blood. On the other hand, any inherent or acquired defect in their mechanism, would of necessity, seriously impair the local circulation and lead, in itself, to the permanent and incurable distension of the venous walls. There can, in my opinion, be no doubt that many cases of varicocele are due to this cause. Local injuries, such as contusions and sprains may be presumed to act in this way by rendering the veins themselves incapable of performing their duty in forcing their contents on toward the heart. These are the cases in which the ligature by obliterating the vessels altogether, and compelling the blood to seek other and healthier channels, is most effeetive. The morbid area is here comparatively small, and if other more general causes of trouble are wanting, the operation is effective in causing a radical cure. In another class of cases, however, in which the seat of trouble is also in the venous walls, a cure is vastly more difficult and often impossible. In this class, a very small one, there is a general disposition to varices. The entire venous system would appear to be inherently defective, and the youth, affected in this way, will show early a tendency to dilatation of many veins. The veins of the scrotum, of the rectum, of the legs, and even of the arms will become thin and swollen. I have seen one or two cases of this kind and regard them as practically incurable, for you may obliterate the veins and cut off the scrotum, or do what you will, and the disease will tend to recur. It is remarkable, however, that when this tendency is acquired, later in life, as when old people become affected with varicosities caused by general vascular degenerations the spermatic veins generally escape, even though the the scrotal veins become enlarged. At least this is my experience in such cases.

It is uncertain in how great a proportion of cases the ætiology of the disorder must be sought for in primary disease of the venous walls. The disease is found only rarely associated with a general disposition to varices. "Landouz" found only one person in fifteen affected by varicocele who had also varicose veins of the legs, and of twenty other persons who had varicose veins of the legs, not one had varicocele, neither was he able to trace any connection between varicocele and hæmorrhoids. "Curling" confirms this statement from his own experience.

I have spoken of intermitting muscular pressure as a chief factor in the local circulation of the blood in the veins, and wish to emphasize its importance for the reason that it seems to have been lost sight of in the study of morbid conditions under consideration. The assistance given to the general venous circulation by the contraction of the muscles which are immediately adjacent to the veins is well understood. But the fact that the spermatic veins, are peculiarly dependent on muscular pressure for their support has seemed to have escaped observation. My own studies of this subject have led me to the conviction that every man would have a varicocele were it not for the action of certain muscles which continually urge the blood onward, and prevent undue distension of the spermatic veins. These muscles are, first, the cremaster; second, those of the abdominal walls, and third, the tunica dartos of the scrotum. Of these the cremaster is the most important, and it is very clear that its main function has been overlooked by anatomists and physiologists, who ascribe to it only one function, that of raising the testis. A mere superficial study of these muscular fibres, however, show that they afford a most powerful brace and support to the spermatic veins, and assist, by their contraction, most materially, in the circulation of the blood through those channels.

The cremaster muscle consists of a series of muscular and elastic fibres which seem to be a continuation of the internal oblique. They arise from Pouparts ligament, pass in a series of loops of various lengths, over and partly around the spermatic cord, and are attached to the pubic bone. The lowermost loops are fastened at the middle, to the testis. In a few instances loops have been found to surround the cord, but this is not common, although in all men

they are so fastened to the sheath of the cord, that their contraction serves the purpose of a constrictor of the cord and its vessels. In some persons they are large, and in others small, and in a few, entirely wanting. They are usually most developed in strong, muscular men. They are connected together and to the areolar tissue of the cord by the cremasteric fascia, and their contractions draw taut the sheath of the cord, elevate the testicle and compress the spermatic veins. These contractions take place readily on any sudden irritation of the inside of the thigh and thus constitute the so-called cremasteric reflex, but they also occur from internal causes and irritations. Their action is assisted to some extent by the contraction of the tunica dartos, which shortens and corrugates the scrotum. The cremaster cannot contract without squeezing the blood out of the veins inclosed between its fibres in front and the inelastic tissue behind, which surrounds the spermatic cord, and which is firmly bound to the overlying muscular fibres. Caught between these opposing forces, the veins become emptied of their blood, to fill again the moment the contraction ceases. Now, this is the true and only important function of the cremaster. The testicle, by its weight, serves as a point of resistance, which enables the muscles to contract more firmly, and it is of course, raised whenever that muscle acts, but its elevation is only an incident in the exercise of the more important duty, which devolves upon the cremaster, that of propelling the venous blood upwards, and relieving, for a moment, the over-distended veins.

The force, which it exerts, acts from below, upwards, and the stimulus which produces its frequent and voluntary contraction, proceeds probably from the irritation excited in the veins by their over-distension. However, that may be, I do not doubt that the external support, which the muscle yields, is essential to the health of the venous walls and whenever it is wanting, especially in youth, whether from defect in the muscle itself or paralysis of the nerves which supply it, that condition is liable to develop which is termed varicocele. In more advanced life, the walls of the veins become firmer and less yielding and they can better withstand the loss of external support, for it is a curious fact, as I have already said, that these venous degenerations which occur in advanced life, and produce hæmorrhoids and varices of the lower extremities, rarely affect the veins in the cord, although not uncommon in the more superficial veins of the scrotum.

In the inguinal canal, the veins are exposed to the pressure of the ever-contracting abdominal muscles. Here again they receive an invaluable assistance in enabling them to perform their functions. The operation of this intermitting pressure is precisely that which occurs below when the cremaster contracts. During a muscular contraction, which narrows the inguinal canal the blood is forced from the contained veins in the direction of the least resistance, which is upward and inward. On the occurrence of muscular relaxation, they become again distended with blood,and the constant repetition of these movements, make a most important and indeed most essential factor in the venous circulation.

It is curious that this very muscular contraction of the abdominal muscles around the inguinal canal has been enumerated as a cause of varicocele, whereas it is doubtless if the circulation of the blood through the spermatic veins could take place without it, and yet it is very possible that the violent and spasmodic contraction of muscles may cause varicocele in this way. A vigorous young man engages in some struggle, such as wrestling or rowing, in which he puts forth all his power in one grand effort. The abdominal muscles contract with great force upon the structures in the inguinal canal and for the moment close entirely the spermatic veins, at the same time the blood is conveyed through the arteries in unusual quantity, and the veins below the inguinal ring become turgid and swollen. If now the cremaster is largely developed, and if at this very moment, it, in common with with other muscles, is put into a violent and almost tetanic contraction, the distended veins caught between the opposing muscles, with no outlet for the contained blood, either burst or stretch beyond the power of recovery.

In the one case, there will result an hæmatocele, and in the other a varicocele. It is probably in this way that these cases of varicocele occur, which are attributed to strain. The very vigor of the cremaster would here coöperate in producing a condition which is ordinarily the effect of cremasteric weakness.

As regards the third group of muscles, which aid the venous flow in the spermatic vessel, the muscular fibre of the tunica dartos, their action is comparatively weak and unimportant. They serve to make the individual more comfortable by holding up the scrotum and materially assist in the superficial circulation through the scrotal veins, but are not strong enough alone either to support the testis or the deeper veins which carry off the blood.

If now we ask how we can apply these pathological conditions to the study of varicocele, we may conclude that of these muscular groups, the abdominal muscles, whatever their condition as regards size, are ordinarily strong enough and act constantly enough to produce the intermitting pressure which is necessary to force the blood upward after it once enters the inguinal canal, while the tunica dartos is too weak in itself to make much difference in the circulation of the deeper veins. With some exceptions the cremaster alone is concerned in the pathology of such cases of varicocele as arise from insufficient muscular support. This muscle varies exceedingly in different men; in some it would seem to be nearly absent, and in these, from very childhood the testes hang low and the varicocele begins early, and in many cases on both sides. As soon as the sexual excitement of puberty begins, the veins begin to swell and the boy of fifteen or sixteen is already forced to wear a suspensory bandage. If the whole muscle is extremely defective, the cremasteric reflex may be altogether wanting. If only partly developed, we may believe that its defect will produce symptoms which would vary with the loops involved in the defect. Thus, if the long loops which descend upon the testes are present in sufficient volume, but the shorter loops which hug the cord are absent or very weak, the cremasteric reflex might be present in considerable degree and yet a varicocele develop in the veins from want of muscular support, while on the contrary, the presence of the shorter loops might prevent venous disease, even though the testicle itself dragged upon the cord, though the absence of the longer loops which should be attached to the organ and lift it up. There is hardly any anomaly of development which one could think of in

regard to this muscle which might not be present, and producing peculiar conditions. The presence of the cremastic reflex therefore would not necessarily indicate the existence of an adequate support to the spermatic vein nor its absence indicate that that support was altogether wanting. Neither would the absence of the cremasteric reflex and the development of a varicocele necessarily prove that the disorder arose from a congenital deficiency in this muscle, for an acquired paralysis would effect the same result.

I am inclined to think those cases of varicocele which are ascribed to excessive sexual excitement may be due to a paresis of the nerve which supplies the cremaster. I have never met with such cases myself but find recorded in practice. One physician told me he had seen four cases which developed in young men immediately after entering upon engagements to marry, presumably due to prolonged ungratified sexual desire. Whether in such cases, there may be any inherent weakness of the nerves or the muscle itself, must be uncertain, but that sexual excitement alone could not produce the disorder, is sufficiently demonstrated by the experience of the vast majority of men.

Varicocele will make its appearance sometimes in connection with obscure trouble of the nervous system. Dr. Imrie kindly sent a young man of sixteen years to me, with a varicocele of the left side, of some three months' duration. A Jew, he had been circumcised in childhood, both testes hung equally low, and as far as the cord would allow. The cremasteric reflex on the right side could be elicited with difficulty and on the left not at all. There was a double varicocele most developed, however, on the left side. The knee reflexes were also wanting and he had suffered for three months from incontinence of urine. I saw the case but twice and was therefore not able to study it as I could wish, but it was evident that there was here a paralysis, possibly of spinal origin associated with and probably causative of varicocele. It is possible that reflex irritations like those produced by narrow foreskins or by intestinal worms, may produce the same result. As showing the connection between affections of the cremaster and those of the testes and cord, I may here mention a case now under my treatment of neuralgia of the testis in a man 46 years of age: it began a year ago without apparent cause, in the left testis and of late has occasionally affected the right; the testis is quite tender and sore, though to the touch not perceptibly altered from the normal. The pains which are nearly continous are chiefly in the testis and cord but sometimes affect the small of the back. I suspected some spinal sclerosis but could not verify that hypothesis, as his knee reflexes were normal and he had no other symptoms. His urine contained nothing abnormal. Now, he had this peculiarity; he had been able to control his powerful cremasters perfectly and jerk his testicles up at will with great power; he did this in my presence, on the right side and I was astonished at the vigor of the contraction. On the left side, however, the ability to raise the testis had failed him and he could produce a contraction of the left cremaster only by moving the two together. Then the contraction of the right muscle had nearly ceased, one could see an imperfect movement of the left. The cremasteric reflex on the right side was prompt and strong; that on the left could not be elicited at all. I fancied that the left veins were slightly swollen and have no doubt that had he been twenty instead of nearly fifty, he would soon have developed a varicocele.

While there are not a few varicocele in which the cremasteric reflex is nearly or quite normal, in the majority of cases, patients show a decided disturbance in the mechanism which produce it.

In how many cases this is due to congenital effects of the cremaster and how many to paralytic conditions, or acquired weakness, I am unable to determine from my inability to complete my observations by the necessary dissections.

It is not easy to obtain autopsies in persons subject to varicocle and I have failed in my efforts in that direction. In operating however, on a living subject for varicocele, I have noticed carefully the conditions of the cord and its coverings and have rarely found a well developed and powerful cremaster, in marked contrast with cases of scrotal hernia, in which the fibres of the cremaster are often enormously hypertrophied.

It is interesting in this connection to study the relations of hernia to varicocele, and more especially as my observations have led me to take issue with some authorities, who have ascribed to hernia the power of producing varicocele by pressure on the efferent veins of the testis.

I can recall only two cases from my practice in which hernia was associated with undue enlargement of the spermatic veins. They were both cases of small hernia in young men of weak muscular fibre, and in both there could be no pressure on the efferent veins by the easily reduced, small protrusions sufficient to cause venous disturbance. It was evident that both disorders were induced by the same muscular insufficiency.

On the other hand, in operating on very large irreducible scrotal hernia, I have had occasion to remark as have many surgeons, the great size and large number of the veins around the hernia. I have never regarded these enlarged veins as at all allied in pathology to varicocele. In the first place, the veins in the testes proper rarely are very much larger than common. The hypertrophy, for I consider it such rather than a varicosity, affects principally the veins of the covering of the testes, those which carry back the blood of the cremasteric and pudic arteries, and while the veins are very large and numerous, they are not more so than is necessary for the nutritive processes of these enormous protrusions and the hypertrophied tissue, which surrounds them. Such patients have none of the subjective symptoms of varicocele, their testes are not atrophied, and I have no doubt that the cure of the rupture, if it were possible, as it rarely is, would be followed by the gradual recurrence of the veins to their normal condition. On the other hand, hernia and varicocele are both so common as disconnected disorders and are so rarely found present in the same individual as coincident disorders that one is almost forced to conclude that there is some antagonism, so to speak, between the two. I believe that this is the case and that the reason of it is to be found in the processes which take place in the development of the testes. According to Curling, the gubernaculum testis exists from an early period of fœtal life as a soft cord of connective and muscular tissue which extends from the lower-most point of the testis by three divisions to the inside of

Pouparts ligament to the os pubis and to the bottom of the scrotum. He belives that the testis is guided into the inguinal canal by that part which is attached to Pouparts ligament, is pulled through the canal by the pubic portion and is finally drawn into the scrotum by the scrotal portion. In its passage through the inguinal canal, some fibres are detached from the internal oblique muscle and form the loop which lies over the front and sometimes around the cord. It is these loops especially which give support to the veins, and aid in the propulsion of venous blood through them, and a moment's consideration will show that if this description of the process is correct, the strength of the walls of the inguinal canal will be inversely to that of the cremaster. If there are only a few fibres detached from the internal oblique the inguinal wall will be stronger, if many are carried down it would, of necessity, be weaker. But strong walls mean less danger from hernia, while a large cremaster means freedom from the liability to varicocele. It is easy to suppose, therefore, that such individuals as are liable to inguinal hernia are less liable to varicocele and vice versa. At the same time, it would not exclude the possibility of both diseases occurring in the same individual, if he were a man generally deficient in muscular development. I have been much disposed to doubt all these theories which refer the development of varicocele to pressure of any kind.

The effects of pressure are ordinarilly felt only when pressure is long continued and the disease which arise from pressure,therefore commonly occur in middle or old age,and we see this exemplified in hæmorrhoids and varices of the legs,which, though not unknown in young persons, are far more common in the aged,but it is notorious that varicocele is a disease of youth and makes its appearance at an age when hæmorrhoids and varicose veins are rare indeed. The pressure of the sigmoid flexure on the left spermatic vein, which is one of the alleged causes of varicocele, must be vastly greater when the gut is filled with long standing accumulations of fæces, such as occur in cancers and strictures of the rectum than in the occasional constipations of youth, and yet, whoever knew a varicocele to arise from that cause. The constipations of middle aged and old men cause hæmorrhoids,but almost never varicoceles. This has been with me so uniform an experience, that I am disposed to conclude that theories which refer varicoceles to such causes are due to imperfect observations.

It is, indeed, a question whether the pressure of the bowels on the spermatic veins would not act rather beneficial than detrimental to the circulation of the blood through them. In the first place, they conduct the intermitting pressure of the abdominal muscles through to the veins, and this must be as we have seen, a great aid, and in the second place, they themselves would subject these vessels to an intermitting pressure, as gas and fæces pass through the gut in ever varying quantities. Only in conditions of chronic, irremediable constipation, conditions uncommon in young men, could a bowel exert that dead, unyielding pressure on a vein which would cause distension of its distal portion. That the left spermatic vein is ever subjected to that kind of pressure, even when the sigmoid flexure is loaded with impacted fæces is a question of great doubt. That the left vein is more frequently affected with varicocele than the right would seem to me to be the result rather of general than of local condition. The whole left side of most men is weaker than the right. The left foot is smaller. The left muscles are weaker. It is possible that the left cremaster, under this same law is in the vast majority of persons, much weaker than the right, and that the left testis hangs lower for the same reason. It is possible, too, that the walls of the veins themselves on the left side may be weaker and less developed, and the vessels of the left side may be weaker and less developed than the vessels of the other side of the body.

To conclude with the summary of this paper, I should say:

1. That the pathology of varicocele is variable, cases differing from one another both as regards causes and pathological conditions.

2. In one group of cases, the fault lies in the walls of the veins which have become weakened either by injury or from congenital or acquired disease. In this group, the cremasteric reflex may be altogether normal.

3. In another class of cases, the primary diseases involve either the cremaster or the nervous mechanism by which it is controlled. The muscles may be congenitally defective in volume or abnormal in position, or it may be entirely wanting, or, on the other hand, it may be either temporarily or permanently paralzed. Whatever the nature of the original affection, these cases are marked by deficiency in the cremasteric reflex, which, in some cases may be altogether wanting, and in others, very weak and uncertain. As the greater proportion of varicocele shows this symptom,it is fair to conclude that the majority of varicoceles are due to affections of the cremaster. It is important that the whole subject should be studied anew, in the light of pathological anatomy, and it will be well for those who are so fortunate as to secure autopsies in persons so afflicted to bear the matter in mind.

Dr. Mynter, of Buffalo, asked whether the knowledge that the cremaster muscle may influence the production of varicocele would have any bearing on the treatment.

Dr. McGraw replied that if we considered the varicocele due to paralysis of the cremaster muscle, electricity might be used, but when the cremaster is wholly absent removal of the scrotum is the best treatment, though this support cannot make up altogether for the intermittent support of the cremaster muscle.

Dr. De Garmo, of New York, said he could confirm two points. He had very carefully watched the effect of pressure as a cause of varicocele and had seen many cases with hernia, but did not think it had anything to do with the production of the former even where bad trusses were worn. He did not recall any case coming on late in life and had never seen a case from strain. In considering the relation of hernia to varicocele he reported a case which he had had under treatment for two years for hernia. It was operated on by another gentleman for varicocele and the hernia was cured. With regard to operation he had used the plan of passing a silk thread round the veins and tying them off. He had had excellent results, no accidents, and no recurrence.

Dr. McGraw concluded by saying, that as his paper had reference only to the pathology, he refrained from saying anything about the treatment.

THE OFFICERS of the Association of American Physicians for the ensuing year are as follows: Alfred L. Loomis, New York, President; R. H. Fitch, Boston, vice-President; I. Minis Hays, Philadelphia, Recorder; Henry Hun, Albany, N. Y., Secretary; W. W. Johnson, Washington, D. C., Treasurer.

THE MANAGEMENT OF GANGRENOUS HERNIA, WITH REPORT OF A CASE.

Read in the Section of Surgery and Anatomy, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY JOSEPH RANSOHOFF, M.D.,
OF CINCINNATI, O.

Nothing more clearly demonstrates the evolution of surgical thought and practice than a comparison of the questions deemed of prime importance in relation to strangulated hernia at the extremes of two decades.

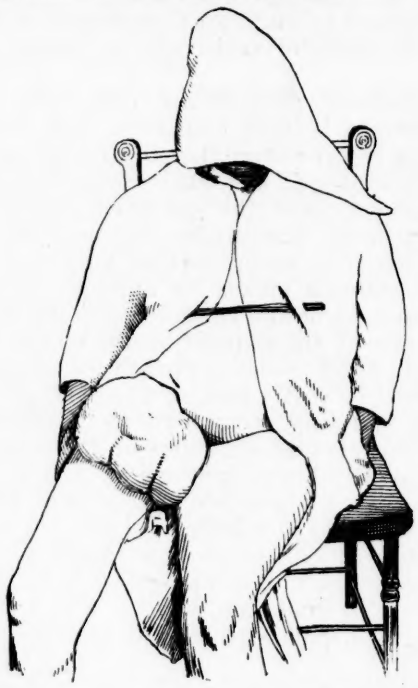
Prior to 1870, the question to be answered in every case was "Is the sac to be opened, or not." At the present, a condition is hardly to be conceived in which the operator would refrain from opening the peritoneal tunic, thoroughly inspecting the hernial contents and wherever feasible supplementing the relief with the radical operation.

Taxis, which then played so prominent a rôle in all cases has been accorded a more and more subordinate position, as its dangers ever increasing with the age of the strangulation were more fully appreciated, and in proportion as surgery sought the light for its manipulations in large and open wounds. Then, the teachings of the German and English schools regarding gangrenous hernia prevailed. The oft-encountered sloughing gut was incised and permitted to drain as an abscess. Now the really vital lesson of kelotomy, that in its early performance lies its safety, has been widely learned. Therefore gangrenous hernias are becoming relatively less frequent. Of 27 cases which have come under my observation, only 4 were gangrenous. Three times have I seen gangrene of the intestine; once of the mesentery alone. In one of the former, the strangulation had existed less than 24 hours. Of 170 kelotomies for strangulation in Hagedorn's Clinic[1] (*Z. f. Chir.*, 32, p. 356) gangrene, real or suspected was encountered but 25 times. In Gottingen Konig[2] had 49 strangulations in 5 years, gangrene being present in 8. Of 61 cases occurring over a period of 12 years in Czerny's[3] Clinic 15 were gangrenous. Of 94 cases operated on in the Mass. General Hospital[4] 7 were gangrenous and 2 doubtful. F. A. Southern of the Manchester Royal Infirmary reports 85 cases of hernia and among them 9 of gangrene. Thus of 486 cases occurring within about twenty years only 68 or about 14% were gangrenous or doubtful cases. Clearly therefore the experience with this condition of any one man, unless disposing over an unusual clinical material, must be limited. It is therefore by cumulative evidence that the proper management of this most fatal complication of hernia must be evolved. In this belief I venture on the report of the following cases:

Case 1.—Walter P. aet. 29, farmer, Carlisle, Ky. Rupture of several years standing. Truss worn, but irregularly. While at work strangulation appeared on the first of August, 1889. Continued work for some time and attempted reduction. After 48 hours Dr. Tilton was summoned but taxis failed. The necessity for an immediate operation was urged but it was declined. I saw the patient on the night of the fifth day. Abdominal distension marked. Obstipation; vomiting frequent but not feculent. Pain severe about umbilicus. Great restlessness. Temperature 102°, pulse 100 and full. Scrotal hernia size of fœtal head; hard and without impulse on coughing. Skin red and œdematous. Operation by lamplight. In the hernial sac was fully a half pint of foul-smelling bloody serum. Omental mass as large as a fist, of dark brown color, putrid and friable; no adhesions to sac. (The latter was a dusky blue in color.) There was no intestine in the hernia. After carefully cleansing the sac and its contents and covering the protruded omentum in gauze, the constriction at the internal ring was divided. The omentum was easily drawn into the wound, after severing some slight adhesions. It was ligated and returned to the abdominal cavity. Thorough intra-abdominal drainage through the wound was provided for. Death 24 hours post-operation from peritonitis. An autopsy was not made.

Case 2.—Mrs. M. aet. 69. Hernia of 15 (?) years standing. Has frequently had symptoms of fecal impaction. After a supposed attack of this kind had lasted three days, Dr. J. Marcus was summoned. I saw the patient in the evening of the fourth. There had been fecal vomiting for two days. Aside from a decided dyspnœa from which the patient suffered at all times the general condition was not good. There was no elevation of temperature. Pulse irregular.

The appended illustration displays the woman's femoral hernia. Large and lobulated it covered the entire upper and lower part of the thigh. Transverse measurement, 11 inches; longitudinal, 7 inches. The greater portion of the hernia was soft. In its depths there was an indefinitely outlined mass which was painful on pressure. Believing the case to be one of impaction within the sac and recognizing the gravity of an operation under the conditions present, the patient was anaesthetized with a view to operation if taxis moderately used did not overcome the difficulty. That I did not operate at once was a fatal error. With very little force gurgling was elicited and the mass before mentioned seemed to have subsided. After coming out from the narcosis, the patient's condition was found to be unrelieved. When I saw her the next day, she was moribund. Exit lethal 16 hours, post-operation.



Autopsy.—On opening the sac it was found to be multilocular. The many diverticula evidently resulting from the lesser resistance of the meshes between the denser fibers of the cribriform fascia. The coils of intestine were for the most part as freely movable as in the abdomen. In one of the saccules an obstruction was found. It was produced by a band as large as a quill. It sprang by a broad base from the free border of a coil of intestine and was attached to the under surface of the mesentery of the same coil. In the loop thus formed a second coil had become entangled. Above and below the constriction-furrow the bowel was normal. In the constriction groove itself a localized gangrene or rather pressure necrosis had led to a perforation. The aperture is about one-sixth of an inch in diameter; and on the free border of the intestine. There is no fecal extravasation.

The band springs from the ilium about 14 inches from the ileo-cæcal valve. It presents a central cavity which tapers off towards its mesenteric attachment. The character and position of the band make it certain that it is a Meckel's diverticulum. Though often producing intestinal acute

obstruction in the belly cavity, I have not been able to find the record of a case where it had given rise to obstruction in a hernia. In this regard the case presented is unique.

Case 3.—Miss D., æt. 30. Seen with Dr. Jenkins, Newport. No previous history of rupture. While lifting a mattress felt something give way in the groin, four days before operation. Was seen by Dr. Jenkins on third day when taxis was attempted. Then vomiting became severe and abdominal pain intolerable. An operation was permitted. Hernia large as a walnut. No impulse on coughing, not very tender. Absolute obstruction since inception. Abdomen not distended. General condition very good. On opening the sac several ounces of bloody serum escaped. There presented itself a knuckle of small intestine apparently of the ileum about four inches long, of bluish color and moderate distension. The serous covering was glistening.

Gangrenous Hernia. Constriction by Meckel's Diverticulum.

In the center of the coil opposite to its mesenteric attachment, there was a black gangrenous patch large as a silver quarter and circular in outline. After carefully cleansing the sac wall and intestine, the constriction at Gimbernat's ligament was divided and then brought into the wound. Although the constriction furrow was unusually deep there was no evidence of present or probable necrosis. The afferent bowel was considerably larger than the efferent coil but presented a healthy appearance. Indeed during the few moments that the hernial contents were being studied with a view to definite action the circulation returned to all of the gut save the gangrenous patch alluded to. It was finally determined to return the entire intestine to the abdominal cavity retaining by two catgut sutures passed through mesentery and wound margins, the gangrenous surface in absolute relation to the floor of the wound. The latter was lightly packed with gauze, and a sterilized dressing applied over all. The vomiting continued for several hours. Ten hours after the operation the patient had several large and watery evacuations. On the fifth day perforation of the intestine ensued and during two weeks the large portion of the intestinal contents discharged through the fistula. Without other treatment than compression the aperture gradually contracted and in a little over a month had entirely closed. The process of sloughing was unattended by either local or general reaction. The patient has since remained well.

Case 4.—Mrs. K. Seen with Dr. Harff. Patient, æt. 56, was for many years the subject of an irreducible inguinal-labial hernia of the right side. Has repeatedly suffered from incarceration. Once reduction was accomplished under anæsthesia. While at work on Friday morning, she experienced a sudden and excruciating pain in the hernial protrusion and suffered immediately from nausea and vomiting. Saw the patient twelve hours after first symptoms supervened.

The hernial protrusion, large as a cocoanut, was soft and resonant throughout. Impulse on coughing plainly perceptible in many parts of the mass. From the base of the hernia projecting towards its surface a coil of intestine could easily be outlined and palpated. It was dense, hard and persisting; like a link of tightly packed sausage in shape and to the touch. Diagnosis strangulation by band; gangrene probable notwithstanding the excellent general condition of the patient. It was nearly midnight when I saw the patient, and necessary assistance was not at hand. The operation was therefore deferred until morning. During the intervening ten hours very extensive effusion into the sac had taken place. The constricted coil could no longer be clearly outlined.

Incision ten inches long in axis of tumor. On opening the sac some half dozen pouches connecting with it were exposed and in them were coils of bowel and adherent omentum. The sac presented the usual appearance of an old irreducible hernia. In one of the compartments near the greatly enlarged ring a loop of the bowel had become fixed by a band. The sac, separated from the general cavity, when opened discharged six or eight ounces of a foul bloody serum. Within it was a coil of gangrenous bowel. Completely sequestering with gauze the infected area, the constricting band was divided and the sloughing gut brought into the wound for inspection. Along the line of constriction a deep groove had been formed but there was no necrosis. The coil itself was of a dark chocolate color and lusterless. Under its surface, which presented few abrasions, were many hæmorrhagic extravasations, chiefly near the border. Perforation had not taken place. Above and below the constriction groove the intestine seemed normal.

The patient's general condition warranting the procedure, primary resection was determined on. Having thoroughly protected the wound, and brought the intestine well down, a gauze cravat was lightly drawn through mesentery an inch above and below the constriction groove. Excision followed, the mesentery being divided a short distance from the gut and parallel to it. Hæmorrhage from the mesentery was free, but no ligatures were required. As the mesenteric wound was brought together by a continuous silk suture beginning at its centre and including its entire thickness, the bleeding points were included within it. When completed the mesenteric suture line measured about four inches. As this suture progressed, the intestinal ends naturally approached each other. No clamp was used, the fingers of an assistant answered admirably. The ends were of uniform diameter. For suturing fine silk and an ordinary cambric needle was used. The suture employed was the continuous Lembert. Particular care was taken at the mesenteric attachment. When completed the suture appeared weak at two points. These were fortified by additional sutures. The sutured bowel was returned to its sac, the wound thoroughly irrigated and closed except for gauze drainage at its most dependent portion. Time of operation fifty minutes. Length of gut removed fourteen inches. Union primary, and recovery uninterrupted; nineteen months have passed since the operation. The patient continues well.

The first case presented is of interest in that the omentum is rarely involved in the sloughing process of a gangrenous hernia. B. Schmidt [6] questions altogether the existence of primary strangulation of the omentum. Of Nagedoms 170 cases, gangrenous omentum was only once the sole occupant of the sac.[7] I have found reports of two other cases, one from Heidelberg; [8] the other of W. H. Bennet [9] of St. Georges Hospital. The safety of the omentum from gangrene is readily found in the ease with which it forms adhesions to the sac wall through which it then receives its nutrition. The case first reported appears

to me to put a quietus on the theory long advocated and recently again promoted by Banks, namely that the constriction ring should not be divided in most cases of gangrenous hernia on the ground that it is a bar to the development of general peritonitis. By the constriction the septic products of the hernia may be isolated for a time. But peritonitis develops from within. In the case presented there was no communication between the sac and the general belly cavity. But just within the neck was the large gut fixed by the adherent omentum, and its wall rendered paretic though traction was unable to resist the passage through it of the organisms which fatally infected the peritoneum. Fortunately there can be but one opinion as to the management of gangrenous omentum. Excision after ligation in healthy tissue, and return to the peritoneal cavity will generally end in recovery unless peritonitis already exists. The three cases quoted all recovered, although in each the medical operation followed that for strangulation. The wisdom of this procedure in all cases might be seriously questioned. In severe cases where peritonitis already exists or is threatened, the last step might advisedly be refrained from and thorough drainage secured. At all events capillary drainage through gauze can never be harmful. It may be relied upon to forestall the development of a peritonitis and where the process already established is yet local, evert a fatal issue.

When gangrene involves the intestine the solution of the problem is far less easy. Since Ramdohr first successfully resected the gut for hernia in 1727, the possible success of primary excision has been conceded. Of recoveries there have been many. But the measure however ideal has never gained firm footing among surgical procedures. This in face of the fact that the results from the alternative measure, that of the formation of an artificial anus, have been most deplorable. Recently Poulsen reports 29 [10] cases with but 4 recoveries. Of thirty-five cases so treated at St. Bartholomews, 4 were saved. (*Brit. Med. Jour.*, 1891, I.,p. 701.) Certain is it that all cases should not be treated alike and that every case ought to be considered with reference, first to the condition of the intestine and its environments and second the probable ability of the patient to bear the shock of a prolonged operation.

In three of the cases presented many of the changes except those of the afferent portion of the bowel were found. For a strangulation affects the gut either along the line of constriction; at some or all points of the coil involved or in the course of the intestine for a varying distance above the point of constriction. Where the constricting band binds the gut, a well marked groove is made by direct pressure. The constriction tight enough to occlude the calibre of the bowel may not interfere with its vascular supply. If gangrene results it will be from pressure at the bottom of the groove and limited in extent. Except for the usually small ulcer in the constriction groove, the gut above and below may be normal in appearance. In the fruitless efforts of nature to protect the general peritoneum, adhesions are quickly formed between bowel and neck of sac. In the attempt to sever these the fragile wall of the bowel tears along the line of constriction. Doubtless many cases of this kind occur, the fecal outpour taking place at the time of operation. To avoid this it might be wise to follow the practice of Mikulicz [11] who in every case of suspected gangrene opens the ring from within the belly cavity, thus making a laparo-kelotomy which permits as he thinks thorough isolation by gauze of the infected area. The difficulty appears in the fact that pressure gangrene limited to the furrow and made by the constricting band is not always easily recognized. Fortunately the tissues about it whether torn by manipulation or not are in a fair condition for partial excision and lateral suture, by which the patient may be saved the perils and annoyance of an artificial anus. Krumm reports such a case successfully treated and Barette three of pressure gangrene successfully managed in the same manner.

The deleterious effects of strangulation are not equally visited on all parts of the coil. In some cases, as in the fourth presented, the entire knuckle is of dull-chocolate or grayish color, with or without subserous hæmorrhages. It is soft, friable, gangrenous throughout. In others as in the second the force of the strangulation,although influencing the circulation of the whole, appears to effect most seriously the central part of the knuckle and at a point removed farthest from the mesentery. It is clear that if in such a case excision were to be done it could only be beyond the limits of constriction. The cyanotic gut about the really gangrenous centre would ill support a suture. Let alone, it will recover. The handling incident to suture might easily prevent it. Furthermore, in cases of this nature the gangrene is often more extensive than is apparent. Beginning generally in the mucosa, the serous tissue is the last and therefore least affected. The fixation of the gangrenous area in the bottom of the wound, relying on nature to make the anus preternaturalis appears to me sound in judgment. The data on which this view is based differ from those which militate against the formation of a fecal fistula when the gut is gangrenous in its entirety.

First and foremost the calibre of the gut remains patent and death from inanition is rendered impossible. Again the artificial anus which results will probably be small and close in a few weeks or months without operative interference. Where the gangrenous area is surrounded by healthy tissue and sufficiently small it may be excised and closed as would be a gun shot wound, or it may be united as suggested by Lindner [12] and closed by sutures holding the contiguous parts together in horizontal fold. Of the former practice and lateral suture Barette [13] reports 24 cases with 21 recoveries. Sachs [14] reports a case similarly treated with success.

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(*To be concluded next week.*)

INTERNATIONAL DERMATOLOGICAL CONGRESS.—The second Dermatological Congress will be held in Vienna from September 5 to 10, 1892.

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SATURDAY, AUGUST 13, 1892.

DISEASE AND CRIME DUE TO HOT WEATHER.

It is a well known fact that petty crime particularly against persons, follows the rise and fall of the temperature with startling uniformity. The late heated term has illustrated this fact in every city and town of the country.

Wherever spirits are sold most of the offenders were intoxicated, or more literally made delirious by the poison of alcohol. Persons accustomed to use spirits are more susceptible to the narcotic effects of alcohol at this time, and manifest unusual irritability and want of judgment. Persons who are not alcohol drinkers exhibit equally strange mental symptoms. This year the number of heat prostrations and sudden alarming exhaustions incident to this condition have been greatly in excess. Transient delusions, severe neuralgias and digestive disturbances have been common. The influence of the late epidemic, influenza, has been traced in many cases. One physician reports that in ten cases of heat prostration, eight were traceable to the effects of influenza, which prevailed from one to six months ago. This sustains the observation of others, that nearly all cases of influenza leave a susceptibility and predisposition to take on diseased conditions from the slightest exposure. The effect of extreme heat is generally understood to favor the formation of poisonous products in the body, and require extreme perspiratory activity in the process of elimination. If the skin and glandular system are defective and do not respond to the demands for increased activity, these products are retained and become active poisons. This is only one of many potent factors which conspire to derange the normal activity of the body in such periods. Why criminal impulses are more active, and less under control in seasons of unusual heat, is not yet clear. The real explanation must be along physiological lines, and facts that show the physical basis of crime. Among alcoholics, the unusual action of spirits on the brain, first irrigating, then narcotizing the brain centers, more profoundly and rapidly at this period is the common observation. But why persons who do not use spirits should give way to impulses at this time, which they are able to control in cooler weather, is a mystery. To say that the brain centers are more unstable, and have less resisting power; also that states of hyperæmia are present predisposing to these abnormalties, is not a full or very satisfactory explanation. The fact to be recognized practically is of more importance than the theory of causation. Viewed from its medical side crime committed in these hot seasons, points to physical conditions that are not reached by locks and bars. Many of these criminals need active medical care more than punishment.

There are many and preventable causes that can be known and reached in this field. Disease following and dating from injury due to periods of excessive heat, suggest to the thoughtful physician different therapeutical lines of treatment. Crime evidently dating from, and due largely to the same cause, is treated as more culpable by the courts. The quiet, inoffensive man who suddenly on a hot day, without having used spirits, becomes angry and assaults some one, is suffering from brain disturbance. A man equally quiet and unobtrusive, feeling bad on a similar hot day, drinks some spirit mixture, and soon after commits assault, or theft, or breach of the peace, or abuses his family, or horse, etc., etc., is suffering from similar causes, and needs medical treatment.

Physicians should study and educate public sentiment to recognize the physical and medical side of these cases. The experience of the recent heated term, if gathered up by competent students, would furnish a chapter of remarkable facts of the most intense scientific interest. These facts are more apparent in the northern and western States, than in the south, and have a direct bearing on the crime wave theory which seems so often supported by statistics.

This theory assumes that crime is due to cosmical and physical causes, which at long intervals gather and burst like storm clouds, then die away to a minimum. A prolonged heated term brings out a vast number of corroborative facts, and also points out apparent causes which seem to be active factors. The teachings of science show that disease and crime are literally interchangeable terms, and the relation is very intimate. Now if certain extreme changes of temperature are followed by increase of one or both, this fact indicates the operation of physical laws that should be studied and understood. Almost every active medical man in the country can contribute facts bearing on this question. Let every physician inquire into the crime and disease of his neigh-

borhood that was dependent in whole or in part on the extreme hot period just past. Also the influence of the epidemic influenza in the past, and alcohol, with all the various unsanitary conditions which favor degeneration and debility.

From the accumulation of numerous facts of this character, many valuable deductions may be drawn, together with practical hints for prevention and treatment.

THE MANAGEMENT OF THE COMPLICATIONS OF POTT'S DISEASE.

Deformity, abscess, and paraplegia are the only complications of Pott's disease occurring with sufficient frequency to merit especial consideration. The management of these complications at the present time is much as follows:

Deformity may be more or less corrected in those cases where the reparative action has not yet reached the stage of appreciable consolidation; or it may be accepted. For correction of the deformity three methods are employed: 1. *Immediate redressment* by longitudinal and antero-posterior traction with weights and pulleys, the patient lying prone, followed by immobilization with the "shell-back" cuirass (BLANCHARD); 2. *interrupted redressment* by partial vertical suspension repeated at intervals of a few weeks or months, the spine being immobilized during the interval with the plaster jacket (SAYRE); and 3, *gradual redressment* by continuous action of the antero-posterior leverage brace (TAYLOR). The circumstances surrounding the individual case should decide the choice of method.

It appears that reparative action is delayed by the corrective process and that permanent consolidation does not take place until immobilization has become continuous and complete. For this and other reasons the majority of surgeons accept the deformity present and immobilize immediately from the beginning of treatment without any attempt to correct the deformity.

Abscesses so located as not to interfere with the application of the immobilizing apparatus and causing no constitutional symptoms have been generally left without interference, but recently there is a growing tendency to aspirate if it is possible to reach the abscess before it has attained any considerable size and inject the cavity with an aseptic mixture of iodoform in glycerine or olive oil. Large abscesses may be opened, their cavities cleansed, injected with the iodoform mixture and closed without drainage. A few remain closed and heal, many refill and opening spontaneously are in no better and no worse condition than if left without interference, and a few become infected and seriously threaten the patient's life. Permanent drainage of these abscesses by the insertion of a tube into the opening adds to the chances of infection and prolongs indefinitely the final closure of the sinus. Without strict asepsis operative procedures should not be attempted; with strict asepsis drainage is unnecessary.

Motor paraplegia requires no special treatment. The area of the diseased spine should be immobilized, the patient should be kept continuously recumbent, and if occurring early in the disease, longitudinal horizontal traction may be employed. Cauterization over the kyphosis is cruel and useless, and the enormous doses of iodide of potash recommended some years ago by GIBNEY are of very doubtful benefit except in cases where there is a strong suspicion of inherited syphilis. Nearly all cases treated by immobilization and recumbency recover from the paraplegia within from one to three years. Paralysis of sensation as well as motion adds much to the seriousness of the complication. Lamnectomy is justifiable, but less benefit is now anticipated from it than was looked for when the operation first came into vogue. Most cases suffering from sensory paraplegia as a complication of Pott's disease ultimately succumb.

EDITORIAL NOTES.

FOREIGN BODIES LEFT IN THE ABDOMINAL CAVITY.—The abdominal walls and cavity display at times a tolerance to surgical manipulations that sets at naught the preconceptions of all students of the authorities. In one respect, however, this tolerance is not very liberally displayed—when foreign bodies, inclusive of articles used by the surgeon, are left behind in the peritoneal cavity after an operation. But even instances of tolerance in this respect are not unknown, where the patient refuses to die even although such an article has been left within the sewed-up wound of a laparotomy. From a Paris letter to the *Medical Press and Circular*, we learn that Dr. Pilatte presented to the Société de Chirurgie a compress of antiseptic gauze that had been detained in a patient's abdomen for eight months. A laparotomy was done upon this woman in April, 1891, followed for a number of weeks by a fair recovery, until in the following August, when pain began to declare itself in the abdomen. The pain grew progressively worse through October and November, until finally, in December, the patient passed by the rectum a roll of gauze fully 8 inches long, which must have been forgotten or overlooked after the laparotomy. Since the escape of the roll of gauze, the abdominal pains have ceased. M. Quénu stated that a similar incident had occurred in his practice. A woman was being operated upon by abdominal section, when a fainting fit made him and all his assistants direct their attention to the cardiac and respiratory needs of the patient. A compress that was used to prevent an escape of the intestines was drawn into the abdominal cavity, and hidden from view by the movements of the woman. The surgeon was assured by his assistants that none of the surgical materials was missing, before he proceeded to close the wound. On the fourth day, however, the patient died. An autopsy was had, and the compress was found twisted in among the intestines. Ever since that time M. Quénu has kept an accurate count of the compresses, as well as of the sponges, that are used in his operations. M. Terrier said that one of his associates had recovered a pair of forceps after a lapse of eight months. The instrument worked its way out through the

umbilicus, and the patient got well. He had himself lost a sponge through a failure to keep a strict count, and the patient lost her life by peritonitis in consequence of the oversight. There are very few surgeons, in the present day, who do not tally off their sponges both before and after an operation. But even this precaution may not avail; it did not suffice on one occasion at least, for a too enthusiastic and helpful nurse tore a sponge in two, and thus caused the count to miscarry. Of all the materials employed by the laparotomist, his sponges are the ones he is most anxious about, since they are the most readily overlooked, and have been overlooked by some estimable and cautious surgeons. These incidents, or accidents, cause chagrin to the surgeon even if the patient's life is not lost thereby; for the patient's road to recovery is greatly hampered by the weeks and months of intense suffering that ordinarily ensue while nature is endeavoring to eliminate the offending body. Extreme vigilance in this regard is the price paid for the best results.

Symptomatic or Secondary Forms of Appendicitis: Paretic Distension of Cæcum.—An admirable paper on appendicitis, as a symptom of distended cæcum, is to be found in the *New York Medical Journal*, July 16, by Dr. P. C. Barker of Morristown, N. J. The author has made it his practice for thirty years to notice and study the cæcum and appendix in every available case of abdominal section. It is his observation that the orifice of the appendix is not always easily discoverable from the mucosal aspect, even when the bowel has been fairly laid open. It is sometimes necessary to search around with the probe point before the orifice is definitely located. But a very different state of things is likely to occur when the bowel at that point becomes progressively distended and inefficient, and when a chronic constipative tendency has been established. The anatomical relations are no longer normal, either as concerns the cæcum, or the meso-cæcum when it exists, or the ascending colon. The latter may be temporarily overloaded with fæcal masses, or it may take on a chronic paretic condition. Peristalsis is proportionately lost; in the chronic groups of cases the cæaum may never be emptied entirely. And what may we infer as a legitimate consequent from these conditions? "It is a fair inference," says Dr. Barker, "that the swarms of micro-organisms that successively work over these detained waste contents of the cæcum are more numerous here than in any other portion of the alimentary canal." It is a clinical fact that the disengaged gases—disengaged but not liberated from that angle in the canal—bring about a more and more relaxed and paretic muscular state. The author has seen this so often that he thoroughly believes in what may be called the paretic cæcum. This may occur in persons whose bowels are reported to be "regular," but constipation is the rule; there may be some degree of distention at the McBurney point, and also some malaise from an autointoxication of fæcal origin.

The next step implies that this paresis of the cæcum effaces the folds and valves that protect the appendix-orifice. The latter is made to gape and may then more readily admit of seeds, concretions, fragments of fæces and the like. With these, and even before them, there may enter the appendix those micro-organisms that infest the canal and its waste products. "And as foreign bodies of appreciable size are oftener absent than present in appendicitis"—and here we have perhaps the seed—thought of Dr. Barker's propositions—"it is quite probable that these microbes not only gain entrance into the appendix, but that they are *the real exciting cause* of the destructive inflammation.

As a merely suggestive addition the writer asks if the bacillus of Klebs-Loeffler may not be the organism that has brought about the present increased prevalence of appendix mischief. It devolves on some one or more of our bacteriologists to throw light on this hypothesis. It may also be questioned if recurrent appendicitis can be made to rhyme with this proposition; for, if the germs of Loeffler or any other pathogeny can thus become entrapped within the walls of the appendix, can their course be other than progressive and without remission—therefore without recurrence? Possibly not, since the microbes would seem to have their most favoring terms of propagation, with a source of supply in the cæcum unreduced and practically limitless.

The work of the microscope seems to be especially called for in this pathogenic field. We need it, in this class of the inquiry more especially, in order to determine whether the parent disease is cæcal or appendical. Dr. Barker's line of therapeutic suggestion based upon the idea of a paresis of the cæcum, permitting bacillar extension and consequent trouble, implies the use of intestinal disinfection and laxation. He states that salol, phenacetine and the mild chloride of mercury have helped him over some "rough spots in the road." During the last three months he has had three cases concerning which he believes that this line of medication has put him in the way of obtaining, in each case, a speedy and good recovery; two of his patients were young lads, the other was a man of fifty—they all three were original seizures.

In a recent meeting of the Clinical Society of London, Sir Dyce Duckworth spoke to the point of the nomenclature of right-groin trouble, and he averred that he did not subscribe to the dropping of the "typhlitis" and the supplanting thereof by "appendicitis," a word which might be American, but certainly is not English. He would undertake to say that this latter word will not appear in the next edition of the Nomenclature of Disease, now in course of compilation by the Royal College of Physicians, nor in the Transactions of the Society. He urged that there must be a great many cases of trouble in the right groin, not associated with an originally diseased state of the appendix, such as a local inflammation of the caput coli, "for which the best remedy was a purge." He had seen many cases of catarrh of the vermiform appendix probably caused by exposure to cold, and an easy step beyond that point will be the formation of concretion in that location.

When we reflect that the word "appendicitis" is only five years old, we can readily understand and almost approve that conservatism of our British friends that leads them to hold that word on a longer probation. But we will make this prediction that if the forthcoming Nomenclature does not contain the term, then the edition next to follow will admit it. The term has come to stay. And furthermore, we may expect other new terms, derived from the same root-meaning, to fit in with our growing knowledge regarding right-groin inflammation. For example, the word "appendectomy" has already been proposed in order to cover, with one word, the idea of a laparotomy performed for the relief of appendicitis.

Camphoid, a new Collodion.—The *American Druggist* refers to the above named substance as a possible substitute for collodion. It is a property of iodoform that it is soluble, one part in ten, in Rubini's solution of camphor—that is, equal parts by weight of camphor and absolute alcohol—and may be thus used as a topical application. This requires fixing on the part, to get the best results; this object is attained by the addition of pyroxylin, one part in forty of the iodoform and camphor solution. A complete solution can be made in these proportions. When applied to the skin with a brush, the fluid does not spread, but dries up in

a few minutes and leaves an elastic opaque film that will not readily wash off. The excess of camphor volatilizes and masks the odor of the iodoform. The gun-cotton may be used with the simple camphor solution, in the strength above mentioned, and be made to serve as an eligible base for dermatic medicaments, such as resorcin, chrysarobin, ichthyol, iodine, carbolic acid or salicylic acid. Martindale, in the *Pharmaceutical Journal* for April 9, suggests that, if the camphor and pyroxylin solution shall prove acceptable to the profession, it may be named "camphoid..' In that event, the formula would read as follows: Camphor, 20 parts; absolute alcohol, 20 parts; pyroxylin, 1 part.

THE THREE STAGES OF THE MEDICAL STUDENT'S LIFE.—The late Dr. Henry Gawen Sutton, of London Hospital and College, was in the habit of dividing up medical student life into three stages, as follows: "First, he doesn't know; second, he thinks he knows, and then he doesn't know, but he stands on his feet like a man, and gives confidence to his patients."

THE CITATION by J. B. H., on page 145 of this current number, of the line from Pope is a movement in the right direction. It goes to show that, even as late as the time of that poet, the disagreements of dialecticians were more prominent in his mind, at least, than were the differences of medical men. But anterior to Pope there was an old latin saying—probably from the times of the schoolmen—containing the words *doctor*, in the sense of teacher, and *discipulus*, or student, in antithesis. This latin adage, and its side-lights, would help to rectify a blundering slur on medicine.

DR. CHAS. WARRINGTON EARLE has resigned the call to Rush Medical College, of which mention was made in our last issue.

ABSTRACTS.

VENOMOUS SNAKES OF NORTH AMERICA.—Dr. Barringer, of the University of Virginia, has given, in the last volume of *Transactions* of the Southern Surgical and Gynecological Association, his views regarding the dangerous serpents of the United States. The rattlesnake, the copperhead, and the water moccasin are sufficiently established in their reputations and have been often described; the first of these is sluggish, the second agile, and the third spiteful. The dangerous capabilities of the harlequin snake, the *elaps fulvius*, however, are less known. This beautiful little reptile, sometimes known as the coral snake or bead snake, is the only known representative of the cobra family in North America. It is found from Virginia to Texas. Its average length is not more than eighteen inches; in color it is blue-black, with brick-red and yellow bars along the caudal extremity. It is gentle and may at times submit to handling without biting. It has fangs, however, and Dr. Barringer has known of a fatal case, death following within twenty hours after its bite. The author estimates that ten per cent. of rattlesnake bites cause death; only one per cent. by the copperhead, and no deaths are known to him as having resulted from the bite of the moccasin. No bacteria have been found in the venom of snakes freshly taken, but a host of septic bacteria may exist in the saliva of these animals, left in the mouth from its food. These latter germs flourish to a greater or less extent in the buccal mucus, and in the case of the copperhead this mucus is so abundant that the name "cotton-mouth" is frequently applied to the snake. In about five per cent. of snake bites a chronic septicœmia is a result of the introduction of these septic germs of the salivary fluid.

BOOK REVIEWS.

A TREATISE ON DISEASES OF THE NOSE AND ITS ACCESSORY CAVITIES. By GRENILLE MACDONALD, M.D. Second Edition. London and New York: Macmillan & Co.

This little volume of less than four hundred octavo pages is dignified by the author with the title prefix of "A Treatise," which its size makes us resent, but if we measure the value of its contents by the character of its subject-matter, we are quite ready to say the title is well deserved.

The author further tells us the book is written particularly for general practitioners. In this he has hit the mark. Nasal affections are among the most common of maladies. Many are easily treated by the general practitioner, for the success of which he needs just such a guide as we find in Dr. MacDonald's book, which sells for the modest sum of $2.50. The illustrations are numerous and excellent.

PUBLIC HEALTH PAPERS AND REPORTS, Vol. XVII, presented at the nineteenth annual meeting of the American Public Health Association, Kansas City, October 20–23, 1991.

The annual volume of the American Public Health Association is before us, and as usual made up of a series of papers by eminent sanitarians, every one is of special value, the scanning of which makes us wish for space to add to its usefulness by a republication in the pages of THE JOURNAL.

The next meeting will be held in the City of Mexico, November 30, 1892.

FOURTEENTH ANNUAL REPORT OF THE BOARD OF HEALTH OF THE STATE OF CONNECTICUT. Year ended November 30, 1891. Registration Report for 1890 of Births, Marriages, Deaths and Divorces. State Printers, Tuttle, Morehouse and Taylor: New Haven. 1892.

This volume contains 650 pages, of which 446 are devoted to the sanitary operations of the Board, under the supervision of Dr. C. A. Lindsley, Secretary, while the remaining pages contain the tables and comments of the Bureau of Vital Statistics.

The State appears, from the reports of the various districts, to have been comparatively free from typhoid fever, in epidemic form, as compared with some recent years. One of the papers of this Report, however, gives some important details respecting an outbreak of fever at a hotel of a popular summer resort. One of the features of the epidemic was the fact that none of the victims were taken down with the fever until they had returned to their homes. And thus it yields a curious instance of typhoid fever taking its origin in one place, from a given water-supply, and the patients separating to widely distant parts of the country during the incubation period, and becoming sick simultaneously or about the same time. The investigation was undertaken by Dr. Herbert E. Smith, of Yale Medical College, and he appears to have welded a strong chain of evidence incriminating drinking-water drawn from cistern supply. The locality infected was Money Island, one of a group of islands in Long Island Sound, much resorted to in the summer months, a nearly bare rock of six acres extent. The infecting case was the keeper of the billiard hall, whose symptoms were those of a "walking case." Of twenty-seven guests of the inn, twenty were traced to their subsequent abodes and were known to have had the fever. One patient only died. None of the employés of the inn appeared to have contracted the disease, they having a different well water for their supply; this water was far from being pure, but it did not receive the infection to which the guests' supply was peculiarly exposed.

Another paper has for its subject the prevalence and peculiar conditions observed as to tuberculosis in New Haven, during a period of fifteen years, prepared by Dr. L.

S. DeForrest. He made a special study of the recurrence of the disease in the same dwelling-houses during those years. He concludes that not a few domiciles of that city have become distinctly dangerous as places of residence, and require specific although not difficult measures to be put in force in order to overcome their infective characters. These measures relate chiefly to the prevention of dried sputum in the house, and to the adoption of ventilation regulations in the homes of the poorer class of people.

A considerable space is given to the reporting of studies that have been made, during the past two years, concerning the surface drinking-waters of the State. There have been sufficient results from these studies to show that a good annual appropriation should be at the disposal of the Board of Health for many years to come. States which, like Connecticut, double their manufacturing wealth every few years, must expect to expend liberally and steadily, for the protection of their citizens from river pollution. Communities too easily ignore the responsibilities that belong to every phase of material advancement. There is no kind of prosperity that can be enjoyed gratis and without commensurate obligation in official life. It commonly rests with medical officials, too, to have to make the fight on behalf of the citizens and their endangered sanitary rights. We close this notice by quoting a wise saying from the Secretary's report, as follows: "It is a trite saying that a spring cannot rise higher than its source; it is equally true that a spring cannot be purer than its source."

A New Pronouncing Dictionary of Medicine. By John M. Keating, M.D., Fellow College of Physicians of Philadelphia; Visiting Obstetrician to the Philadelphia Hospital, and Lecturer on Diseases of Women and Children; Gynecologist of St. Joseph's Hospital; Surgeon to the Maternity Hospital, etc.; Editor "Cyclopædia of Diseases of Children," and Henry Hamilton, author of "A New Translation of Virgil's Æneid into English Rhyme;" Co-author of "Saunder's Medical Lexicon," etc. Price, cloth, net $5.00; Sheep, $6.00 net.

A voluminous and exhaustive handbook of medical, surgical, and scientific terminology, containing concise explanations of the various terms used in medicine and the allied sciences, with phonetic pronunciation, accentuation, etymology, etc.

Most physicians will be pleased with the author's adoption of the anglicized pronunciation, adhering, as he does pretty closely to the general rules laid down in Worcester for the accentuation of English words.

The table of signs and abbreviations is the best we have seen. The table of suffixes and prefixes adds much to the usefulness of the work. While the systematic labor of the author has given us a very valuable dictionary, the publisher has done his part in issuing a book of handsome appearance, but of unnecessary size. The type is new, and attractive in style, but at least two sizes too large. The paper is of fine quality, but extra thick and heavy, the latter qualification being very undesirable in a dictionary. The size of page is convenient but with altogether too much margin for the print. All of which makes us think the publisher is ignorant of the purposes of the book.

A System of Practical Therapeutics, edited by Hobart Amory Hare, M.D., assisted by Walter Christie, M.D., Vol. iii.

This portly tome and last volume of this system of therapeutics follows quickly after its predecessors. The several sections are on Diseases of the Skin, of the Nervous System, Genito-urinary Apparatus, the Eye and Ear. All of which are followed by a complete index.

The chapters on skin diseases are by Drs. H. Radcliffe Crocker, W. A. Hardaway, J. Nevins Hyde and M. B. Hartzell. All of whom are recognized authorities in this specialty.

Among the authors on diseases of the nervous system, we find the names of Edward N. Brush, H. M. Bannister, B. Sachs, J. C. DaCosta, M. Allen Starr, Chas. K. Mills, Landon Carter Gray, Wharton Sinkler, C. E. Riggs, J. Ransohoff, T. D. Crothers and F. H. Dercum.

In like manner the other sections of the work are filled with chapters by prominent and well known specialists, whose professional standing places their literary work beyond the realm of criticism.

SELECTIONS.

Hereditary Transmission of Mutilations.—Dr. C. G. Lockwood, of New York, has recently published some interesting results of his experiments on the hereditary transmission of mutilations. White mice were selected on account of their rapid breeding, as they begin to breed every thirty days. He bred them in-and-in for ninety-six generations, destroying all the sickly and defective ones, and in this way obtained a larger and finer animal than the original pair. His experiments in breeding their tails off were done by selecting a pair and putting them in a cage by themselves and clipping the tails of all the young. When these were old enough to breed he selected a pair, and when they had young, clipped their tails. By continuing this breeding, in the seventh generation he got some young without tails, and finally got a perfect breed of tailless mice. By taking one with a tail and one without a tail, and alternating the sexes in each generation, he finally again got a breed of all-tail mice.—*N. Y. Med. Record.*

Prevention of Puerperal Sepsis.—The application of prophylaxis can have no more useful place than in the lying-in chamber. It is here that an ounce of prevention is worth many pounds of cure. It is doubtful whether puerperal sepsis can be cured in every instance of its invasion, but it is almost certion that it can be prevented in ninety-nine cases out of a hundred. The absorbing interest which is manifesting on this subject is apparent when medical societies in cities, towns and hamlets are everywhere discussing the question with a degree of earnestness, intelligence, and liberality that is as encouraging as it is instructive.

There can be no doubt that a great responsibility rests upon the obstetrician of to-day, greater than at any period in modern times. He must contest the ground with the abdominal surgeon for a record, and especially must he contest the field with the maternity physician for as good work in the mansion, the villa, the cottage and the tenement house. The family physician, who is likewise the obstetrician in the rural districts, must be able to show as good a record as his brother who practices in the courts and alleys of the populous cities, or as he who has the advantage of service in the lying-in hospitals. A few years ago the crowded maternity was considered about the worst place in which a woman could be confined. It was often necessary to close up such an institution when invaded with an "epidemic" of puerperal fever. Now such a thing as closing a maternity by reason of a large number of consecutive deaths from puerperal sepsis is unknown. In a thousand cases we hear of scarcely a death, and there is no such thing as an "epidemic" of puerperal fever.

We have said that much responsibility rests upon the shoulders of the family physician in the rural districts, and he must look to it that his cases are properly prepared for

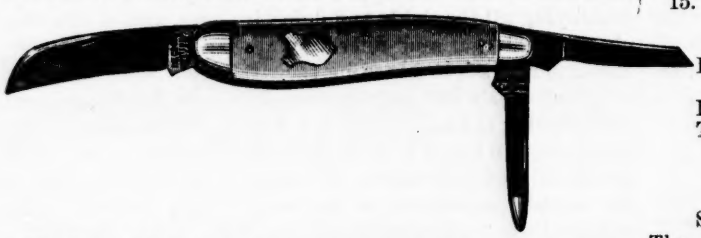
confinement by clean hands that are versed in all that is meant by the term "asepsis." When the general practitioner can be made to enforce the simplest rules of asepsis that he perfectly well understands, but is careless about enforcing, we shall soon hear almost nothing of puerperal fever or of ophthalmia neonatorum. It is not competent to plead lack of time or inconvenience in carrying out those simple details of cleanliness which are the foundation of prophylaxis in the lying-in chamber, and which must be insisted upon where human life is at stake, or loss of vision in the new-born is so often threatened.

QUINQUAUD has confirmed Unna's statement as to the presence of a special microbe in soft chancre. It is a bacillus with rounded ends, and is generally arranged in chains. It is present in prodigious numbers in the lymphatics and intercellular spaces.—*Medical Review.*

A POCKET PLASTER-KNIFE.

BY JNO. RIDLON, M.D., CHICAGO.

At my suggestion J. Curley & Bro., 6 Warren St., New York, have constructed the knife shown in the illustration.



The large blade is a short pruning blade of extra thickness in the shank and thin at the point for use in cutting down plaster corsets and such splints as the surgeon may desire to preserve in perfect shape. The pen-blade is for use when it is desired to preserve the jacket or splint. Being entered obliquely layer by layer of the plaster bandage rises as it is cut through, all troublesome wedging of the knife is avoided, and the chances of wounding the patient are lessened. The third blade is a nail file with Curley's patent burnisher.

MISCELLANY.

MEETING OF THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.—The next meeting of the American Electro-Therapeutic Association will be held this fall in New York City, at the Academy of Medicine, on October 4, 5, and 6. The President is Dr. William J. Morton of New York, Secretary, Dr. Horatio R. Bigelow, 1716 Chestnut St., Philadelphia. The local Committee of Arrangements are Drs. Robert Newman and A. H. Goelet of New York.

AMERICAN DERMATOLOGICAL ASSOCIATION.—Programme of the Sixteenth Annual Meeting of the American Dermatological Association to be held at the Pequot House, New London, Conn., September 13, 14, and 15, 1892.

Papers:

1. Iodine and Carbolic Acid in the Treatment of Skin Diseases, by Dr. C. W. Cutler.
2. Additional Note on the Treatment of Erysipelas based upon a second series of fifty Cases, by Dr. C. W. Allen.
3. A Suggestion for Operative Procedure on erectile Nævi over Fontanelles, etc., by Dr. S. Sherwell.
4. How Should Dermatology be Taught? by Dr. G. H. Fox.
5. A Somewhat Unusual Case of Lupus Ulceration of the Nose, by Dr. H. W. Stelwagon.
6. Lupus Vulgaris following Exposure to Tuberculous Sputa, by Dr. W. T. Corlett.
7. Notes on the Treatment of Lupus Erythematosus, by Dr. J. Zeisler.

Discussion on Alopecia Areata:

1. Are there two forms of alopecia areata; one parasite and one neuropathic?
2. Is there sufficient evidence to prove the contagious nature of the disease?
3. Does arsenic or any other internal remedy influence the course of the disease?
4. What is the comparative value of carbolic acid, and of other topical remedies?
5. Will epilation of the margin of the patch prevent its spread?
6. What circumstances influence the prognosis of the disease?

8. Alopecia Prematura; its most Frequent Cause, by Dr. G. T. Elliot.
9. Cases of Favus Contagion from the Lower Animals, by Dr. S. Sherwell.
10. Some Observations on the Growth of Achorion Schoenleinii in America, by Dr. L. Heitzmann.
11. Morphœa Atrophica, by Dr. R. W. Taylor.
12. Psorospermosis, by Dr. M. B. Hartzell.
13. Report of a Case of Adenoma Sebaceum, with Microscopic Drawings, by Dr. J. A. Fordyce.
14. Concomitance and Sequence in Skin Eruptions, and the Influence of one Dermatosis upon another, by Dr. C. W. Allen.
15. The Cicatrices of Syphilis, by Dr. J. N. Hyde.
16. An unusual Case of Syphilis, by Dr. R. B. Morrison.
17. An exaggerated Case of Impetigo Contagiosa, by Dr. G. T. Elliot.
18. Notes on a Recent Visit to the Leper Hospital, Havana; Leprosy in Charleston, S. C., etc., by Dr. W. T. Corlett.
19. Notes on the Use of Thilanin, by Dr. G. H. Fox.

SOUTHERN SURGICAL AND GYNÆCOLOGICAL ASSOCIATION.—The annual session of the Association will be held in Louisville, Ky., on November 8, 9, and 10. Those proposing to assist in making the meeting a success by the contribution of papers should promptly notify the Secretary, Dr. W. E. B. Davis, of Rome, Ga., of the titles at their earliest convenience. To those desiring to nominate candidates for membership, blanks will be furnished on application. Dr. J. McF. Gaston, of Atlanta, Ga., is president, and is actively at work to make this session as great a success as any of its predecessors.

OFFICIAL LIST OF CHANGES in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from July 16, 1892, to August 5, 1892.

Capt. Edwin F. Gardner, Asst. Surgeon U. S. A., is granted leave of absence for fifteen days.

Major C. E. Munn, Asst. Surgeon U. S. A., leave of absence granted for seven days, and extended thirteen days, is hereby further extended three days.

Major Alfred A. Woodhull, Surgeon, granted leave of absence for two months, to take effect on or about August 1, 1892.

P. A. Surgeon Henry B. Fitts, U. S. Navy, is assigned, temporarily, to the charge of the Army and Navy General Hospital, Hot Springs, Ark., to take effect during the absence therefrom of Surgeon Woodhull, the surgeon in charge. By direction of the President.

Major C. E. Munn, Surgeon U. S. A., leave of absence granted for seven days is hereby extended thirteen days.

Lieut.-Col. Charles R. Greenleaf, Asst. Medical Purveyor U. S. A., will proceed at the proper time to Montpelier, Vt., and visit the camp of the Vermont National Guard during the period of its encampment, commencing August 23, 1892. By direction of the Secretary of War.

Major J. K. Corson, Surgeon U. S. A., granted leave of absence for one month, to take effect on or about August 2, 1892, provided Capt. W. B. Banister, Asst. Surgeon U. S. A., shall have returned from leave of absence, with permission to apply for an extension of one month.

Capt. William O. Owens, Asst. Surgeon U. S. A., leave of absence extended fourteen days.

OFFICIAL LIST OF CHANGES in the Medical Corps of the U. S. Navy, for the Week Ending August 13, 1892.

Surgeon P. A. Lovering, ordered to the Marine Rendezvous, Boston, Mass.